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H. A. DE WEERD, *Editor*
Joseph Mills Hanson, Siert Frederick Riepma, and Don Russell, *Associates*
Frederick P. Todd, *Secretary*

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All correspondence should be addressed to *Frederick P. Todd, Secretary, Box 382, Benjamin Franklin Station, Washington, D. C.*

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THE CRATER

Photograph: Signal Corps

THE BATTLE OF THE CRATER

*By Alfred P. James**

ONE of the most dramatic events of the Civil War was the so-called Battle of the Crater in front of Petersburg, Virginia, on July 30, 1864. In a very real sense this battle was the climax of the campaign of 1864 in Virginia. A glance, therefore, at the campaign and the general situation leading up to this unique operation is necessary.

After the battle of Gettysburg, early in July 1863, General Robert E. Lee fell back across the Potomac River into northern Virginia and established himself in his old haunts south of the Rapidan River. Proceeding with great caution, Major General George G. Meade, Commander of the Union forces, advanced into the same general area. The autumn and winter were consumed in extremely cautious moves and counter moves in this great battle ground of the war.

In the meantime, Major General U. S. Grant had captured Vicksburg and in the late autumn driven the Confederate forces, under General Braxton Bragg, out of Tennessee into Northern Georgia. Reward for such service to the Union cause was natural. Congress in February, 1864, revived the rank of Lieutenant General in the United States Army, a rank hitherto bestowed only upon George Washington and Winfield Scott; and President Lincoln, as Congress had anticipated, gave Grant this rank and appointed him Commander-in-Chief of all the Union armies.

Lieutenant General Grant himself assumed control of operations in Virginia against the redoubtable forces of General Lee. On the fourth of May, the Army of the Potomac, still commanded by Major General Meade, but now under the general direction of Lieutenant General Grant, crossed the Rapidan and entered that forest-covered region famous in American history as the Wilderness. With a magnificent fighting force of 122,000 men well drilled and amply equipped, Grant had ventured into the domain of General Lee's Army of Northern Virginia. Two days of terrific fighting followed, with wavering fortune and great losses on both sides. The Union Commander-in-Chief is quoted by one writer as having stated on the morning of May 7, 1864, that "Joe Johnston would have retreated after two days of such punishment." [1] On the other hand such opposition in earlier campaigns in this same area had led to the retirement of McDowell, Pope, Burnside, and Hooker. But instead of retiring behind the Rapidan, Grant, unable to accomplish anything in the Wilderness, began the first of a series of oblique moves to the left, in the general direction of Richmond.

* Professor of History, University of Pittsburgh.

[1] Atkinson, C. F., *Grant's Campaign of 1864 and 1865*, I, 205. Quoted in Edward Channing, *A History of the United States*, VI (New York, 1925), 567, footnote 1.

The Confederate Commander replied with a corresponding move on inside lines, and, in the neighborhood of Spottsylvania Court House, the forces again collided with heavy losses and equally indecisive results. Another move to the left brought the two armies face to face on the North Anna River, but the Union Commander-in-Chief declined battle and moved farther along in another oblique movement to the left. This move, again anticipated by General Lee in a similar operation, brought the two armies together at Cold Harbor, almost within sight of Richmond, on the battle ground of the campaign of midsummer two years earlier.

In a desperate attack on the intrenched Confederates, the Union forces received a severe check. It became evident that Lee's army could neither be destroyed nor dislodged and that Richmond could not be captured by direct attack from the north. In the face of losses amounting to nearly fifty thousand men, Grant, in a way historians have strangely ignored, abandoned his famous proposal "to fight it out on this line if it takes all summer." * The destruction of Lee's army as a direct objective was not within realization. Further attack on the Confederates north of the James River was resigned. Assaults on intrenched troops, as was amply demonstrated at Cold Harbor early in June, were altogether too costly. In fact, the use of intrenchments and fortifications in 1864, both in Virginia and Georgia, foreshadowed the trench warfare of the World War fifty years later. Experience in 1864 proved that one soldier behind adequate intrenchments was more than the equal of two opponents making direct attack across open fields. In the case of an attacking army, mobile, less than double in numbers, and with a territorial objective, flanking movements and oblique marches were the alternative and the natural result.

Just before the middle of June, therefore, after more than a week of hesitation, Grant pushed his forces across the Chickahominy and marched toward the James River, much as another Union commander in this region, Major General George B. McClellan, had done two years earlier. The student of the military history of the Civil War observes very easily the parallel between the position of McClellan in July 1862 and that of Grant in June 1864, a parallel which either adds to the credit usually given to McClellan or detracts from that given to Grant.

Danger to the Confederacy, by attack from the James River, appeared six weeks before Grant's appearance on its banks with the Army of the Potomac. On the day when Grant moved across the Rapidan, Major General Benjamin F. Butler moved up the James River with the Army of the James, about thirty thousand strong. On the following day he occupied City Point and Bermuda

* According to Grant's *Personal Memoirs*, II, p. 563, it was understood by Generals Butler and Meade before starting on this campaign that both their armies would be thrown south of the James River in case Grant failed to destroy Lee. (Editor's note.)

Hundred on the peninsula between the James and Appomattox Rivers. For ten days Richmond and Petersburg, its vital outpost to the south, were in grave danger. But scattered forces from the Carolinas were rushed up under the command of General P. G. T. Beauregard and the danger was overcome. A month of trench warfare followed, with the situation in the middle of June much that of a stalemate, but with the Confederate line south of the James River thinly manned, while south of the Appomattox River a line of intrenchments was even more weakly held.

Even after the engagement at Cold Harbor, Lee seems to have expected further assaults on Richmond from the northeast and in some way appears to have lost effective touch with the Union forces in the Army of Potomac. His opponent in the meantime adopted the old idea of McClellan that Petersburg was the key to Richmond and that Lee's army, north of the James, an invincible defense of the Confederate capital, could and must be ruined by cutting off the supplies it was receiving from the south.

Without interference of any importance, the Army of the Potomac began crossing the James River on June 14, 1864.[2] As rapidly as possible the troops on crossing were hurried forward and thrown against the defenses of Petersburg. But the thinly held intrenchments of the Confederates, who numbered less than three thousand, proved an insurmountable obstacle.[3] Again the importance of intrenchments was demonstrated beyond question. It was a repetition of the attack and outcome at Cold Harbor two weeks earlier. After the arrival of General Lee's veterans in full force on the Petersburg front, further Union assault on the Confederate intrenchments was abandoned. Warfare on the Petersburg front settled down quickly into trench warfare destined to last for nine months and to end only with the exhaustion and internal collapse of the Confederacy.

In this long drawn out trench warfare, which characterized the siege of Petersburg, the historic event was the explosion of the Union mine under the Confederate fortifications at daybreak on the thirtieth of July.

The intrenchments and fortifications of the opposing forces, on the east of Petersburg, ran almost due north and south, in an irregular line, across hills and ravines.[4] Virtually all of the defensive measures used in trench warfare during

[2] *War of the Rebellion, A Compilation of the Official Records of the Union and Confederate Armies* (Washington: Government Printing Office, 1892), Series I, Volume XI, Part I, p. 12, Grant to Halleck, July 14, 1864. This publicatoin will hereinafter be referred to as *Official Records* and unless otherwise indicated it will be understood that the references are to Series I.

[3] *Ibid.*, 27. Union casualties amounted to 9,500.

[4] See "Map No. I, Siege of Petersburg, Va." in *Battles and Leaders of the Civil War* (The Century Co., New York, 1884), IV, 538. See also the *Atlas to Accompany the Official Records of the Union and Confederate Armies, 1861-1865*, Part I, Plates LXIV, Nos. 1, 2 and 3; LXXVII, No. 2; LXXVIII, No. 5; and Part II Plate C, No. 12.



FEDERAL TRENCHES, 1864

Photograph: Signal Corps

the World War, were worked out in front of Petersburg, Virginia, in the summer of 1864. To all intents and purposes the struggle on this front had, by the last of June, reached a stalemate so far as direct attacks were concerned. The situation was much like that along the river Aisne in France after both sides had "dug in" in September, 1914. As in the latter case, so in the former, the eventual outcome depended upon final superiority in men and other resources.

Among the Union troops in front of Petersburg in June, 1864, was the 48th Pennsylvania Veteran Volunteers, composed mainly of miners from the anthracite coal region of the upper Schuylkill Valley and commanded by Lieutenant Colonel Henry Pleasants, an experienced mining engineer.[5] To some non-commissioned officers and privates[6] of this regiment, the topography of the region suggested the possibility of running a mine under the portion of the Confederate work on their immediate front. Pleasants welcomed the suggestion. He possessed the training necessary to superintend the proposed operations and, in the men of his regiment, he possessed exactly the kind of skilled workmen necessary for its execution.[7] He carried the proposal direct to Brigadier General Robert B. Potter, commanding the Second Division of the Ninth Army Corps.[8] Potter presented the matter in writing to Major General Ambrose E. Burnside, commanding the Ninth Army Corps. Potter's letter of June 24, 1864, is not only very interesting, but probably the earliest written statement about the project. Its importance justifies citation in full, as follows:

General: Lieutenant-Colonel Pleasants, of the Forty-eighth Pennsylvania Veteran Volunteers, commanding First Brigade, has called upon me to express his opinion of the feasibility of mining the enemy's work in my front. Colonel Pleasants is a mining engineer and has charge of some of the principal mining works of Schuylkill County, Pa. He has in his command upward of eighty-five enlisted men and fourteen non-commissioned officers, who are professional miners, besides four officers. The distance from inside of our work, where the mine would have to be started, to inside of enemy's work, does not exceed 100 yards. He is of the opinion that they could run a mine forward at the rate of from twenty-five to fifty feet per day including supports, ventilation, and so on. It would be a double mine, for as we cannot ventilate by shafts from the top, we would have to run parallel tunnels and connect them every short distance by lateral ones, to secure a circulation of air, absolutely essential here, as these soils are full of mephitic vapors. A few miners' picks, which I am informed could be made by any blacksmith from the ordinary ones; a few handbarrows, easily constructed; one or two mathematical instruments, which could be supplied by the engineer department, and our ordinary intrenching tools, are all that are required. The

[5] *Official Records,* Vol. XL, Part I, 45, 58, 526, 544; Part II, 396, 397. See Joseph Gould, *The Story of the Forty-eighth, A Record of the Campaigns of the Forty-eighth Regiment Pennsylvania Volunteer Infantry;* published by authority of the Regimental Association, Chapter XIV and XV of which are valuable on the battle of the crater.

[6] *Ibid.,* Part I, 523. In his testimony before the Congressional Committee on the conduct of the war, January 13, 1865, Colonel Pleasants claimed to have originated the idea. *The Report of the Joint Committee on the Conduct of the War. Battle of Petersburg* (Washington, D. C., 1865) p. 112

[7] *Ibid.,* Part I, 58, 523; and Part II, 397.

[8] *Ibid.,* Part I, 58, 523, 527; Part II, 396.

men themselves have been talking about it for some days, and are quite desirous, seemingly, of trying it. If there is a prospect of our remaining here a few days longer, I would like to undertake it. If you desire to see Colonel Pleasants, I will ride over with him or send him to you. I think, perhaps, we might do something, and in no event could we lose more men than we do every time we feel the enemy.[9]

In response to this letter, Burnside sent word, probably not in writing, that he would be glad to take the matter into consideration.[10] Accordingly Potter and Pleasants went to Burnside's headquarters and laid the plan before him.[11] In the language of the testimony of Burnside given under oath before a court of inquiry: "The matter was fully discussed, and I authorized General Potter to commence the work, making the remark, if I remember right, that it could certainly do no harm to commence it, and it was probably better that the men should be occupied in that way, and I would lay the matter before General Meade at my earliest opportunity. We parted with that understanding, and the work was commenced." This conference must have taken place within twenty-four hours after the writing of the first letter, for at noon on June 25, 1864, work on the mine was begun.[12] At 2:45 P. M. Burnside informed Meade of the plan. "We have commenced a mine," he stated, "that will reach the batteries of the enemy in our front by a reach of 115 yards. I have given orders for all the necessary changes of the line to make the work ordinarily secure. We want about 7,000 sand-bags, or more. I think we can break the line of the enemy in due time if we can have the necessary facilities. We want heavy guns very much. Can we have the sand-bags?"[13] Within fifteen minutes, General Meade received the written request and by letter replied: "I have directed Duane to send you an engineer officer and a company of sappers, and Hunt to send you sand-bags and siege guns. I am delighted to hear you can do anything against the enemy's line, and will furnish you everything you want, and earnest wishes for your success besides. I would have been over to see you today, but certain movements of the enemy on the left have kept me here."[14]

That Meade meant what he said is proved by the immediate dispatch with which he acted. Messages trying to locate the necessary sand-bags for the advancement of Burnside's line of fortifications were sent hither and thither to various depots. No less than ten of them are recorded during the afternoon and evening of June 25, 1864.[15] Late in the night, evidently after 10 P. M.,[16] Brigadier General Godfrey Weitzel, chief engineer with the Army of the James, sent Burnside the message: "I have just ordered 8,000 sand-bags to be sent to you from my depot at Bermuda Hundred with all possible haste. I imagine they will reach you about 1 o'clock."[17]

[9] *Ibid.*, Part II, 396. [10] *Ibid.*, Part I, 58. [11] *Ibid.*, 526, 527.
[12] *Ibid.*, 556. [13] *Ibid.*, Part II, 417. [14] *Ibid.* See also, Part I, 58.
[15] *Ibid.*, Part II, 406, 417, 418, 422, 423. [16] *Ibid.*, 423. [17] *Ibid.*, 418.

At or near the time specified the sand-bags must have arrived, for at 11:30 A. M., June 26, 1864, Burnside informed Meade: "We succeeded in moving our main advanced line out of the skirmish line beyond the railroad cut and within 100 yards of the battery to which we are running the mine, so that the mining party is now pretty well protected."[18] In the meantime, at 9 A. M. on the same day, Meade had informed Grant in the statement: "General Burnside having expressed the opinion he could successfully advance against the enemy by opening trenches, I have directed him to be furnished with engineer officers and troops and the necessary ordnance and materials from the siege train. . . ."[19] In a reply at 10:30 A. M. from his headquarters at City Point, General Grant said: "I have ordered out all the guns and other articles called for by General Hunt."[20]

Thus in a few days an idea originating almost at the bottom of an army was pushed upward until it had the sanction of the highest command. While it was the particular interest of the Forty-eighth Pennsylvania Veteran Volunteers and of Lieutenant Colonel Pleasants, Brigadier General Potter and Major General Burnside, it was approved by Major General Meade and accepted by Lieutenant General Grant. The project, it is true, proved a failure, and, after the event, in the court of inquiry, several people qualified their earlier sanction. But it is beyond doubt that the whole affair was a concerted effort of the entire Union forces and was recognized as such.

Work on the main gallery of the mine, begun at noon on June 25, 1864, was pushed forward as rapidly as circumstances permitted. On June 28, 1864, before 10:55 A. M., Burnside was able to report: "The mining operations are progressing well—140 feet of gallery has been made."[21] At 8 P. M., on the same day, Potter stated, "The gallery was run fifty feet the first day and forty feet each day since, which rate of progression Colonel Pleasants thinks he will be able to maintain."[22] As early as the last day of June, "Five tons of blasting powder and 1,000 yards safety fuse" were ordered for Burnside.[23] At the end of the first week of mining, July 2, 1864, at 10:15 A. M., Burnside was able to report: "The gallery is now 250 feet in length." But he added: "We experienced some difficulty yesterday from running into quicksand; the props gave way and a considerable portion of the top fell in. A more complicated system of propping will have to be resorted to, but we hope to overcome the difficulty today."[24]

On the third of July, Grant, becoming impatient with siege operations, inquired of Meade if he thought it possible, "by a bold and decisive attack to break through the enemy's center."[25] Meade replied that he would consult Generals Warren and Burnside.[26] Warren advised against the attempt, but Burnside was of the

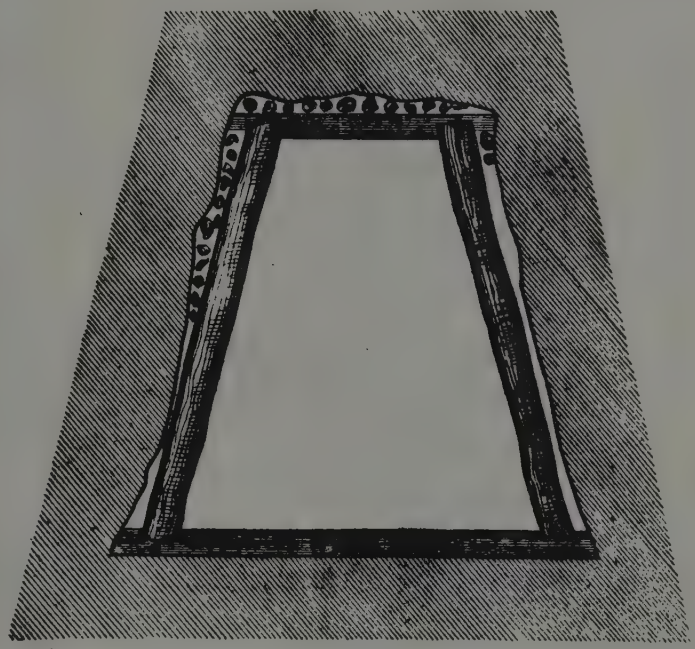
[18] *Ibid.*, 497. [19] *Ibid.*, 431. [20] *Ibid.* [21] *Ibid.*, 482. [22] *Ibid.*, 484. [23] *Ibid.*, 528.
[24] *Ibid.*, 590. See *ibid.*, Part I, 31, Dana to Stanton July 3, 1864—9 A. M.
[25] *Ibid.*, Part II, 599. [26] *Ibid.*

opinion that with the completion and explosion of the mine, "an assault could be made to advantage."[27] To the proposals of Burnside, Meade replied: "I agree with you in opinion the assault should be deferred till the mine is completed, provided that can be done in a reasonable short period—say a week."[28] In answer to a questionnaire submitted to him on July 3, 1864, by Brigadier General John G. Barnard, chief engineer with the Union forces, Pleasants stated in a partial reply on July 7, 1864: "The mining has been carried on without interruption since it was begun. There are 210 men employed every twenty-four hours, but only two can mine at a time at the extremes of the work. The tunnel will reach the enemy's work in about seven or eight days."[29] This was written three days after Burnside in a message to General Meade had said: "With ordinary good fortune we can pretty safely promise to finish the mine in a week—I hope in less time."[30]

But the general attention of the Union commanders was at this point distracted from the mining operations. Both the authorities at Washington and Grant became greatly disturbed by the Confederate campaign under Early in the Shenandoah Valley and against the Union capital. From July 5 to July 15, the movement of troops from Virginia to Maryland by water was extensive and almost continuous.[31] The Sixth Corps of the Army of the Potomac was sent off, to be followed by parts of the Eighteenth Corps, which at this time was being drawn back to Virginia from an expedition against the sea-coasts of the lower South. Even if the mine had been completed and ready for use, nothing could have been done in the second week of July. It was not until the night of the fourteenth of July that the mine again became a subject of correspondence, when Burnside reported: "We are making the usual progress with the mine."[32] According to the official report of Pleasants, "On the 17th of July, the main gallery was completed, being 510.8 feet in length."[33]

Thus in a little more than three weeks, Pleasants and his coal miners had run a deadly threat to a point immediately under the Confederate lines. The work had not been easy. The requisite tools, lumber and other materials were lacking.[34] The material excavated was carried to the rear at night in handbarrows made out of cracker boxes. The gallery, about five feet high by four feet six inches wide, was "supported by props along its whole course at a distance from each other ranging from three to thirty feet, according to the nature of the roof." In addition, the excavators ran into "a stratum of marl, whose consistency was like putty," which retarded the progress of excavation and caused additional loss of time.[35]

[27] *Ibid.*, 600, 603, 604, 608. [28] *Ibid.*, 609. See, also, *ibid.*, Part I, 31. [29] *Ibid.*, Part II, 610-611. [30] *Ibid.*, 630-631. [31] *Ibid.*, Part III, 3-275, *passim*. [32] *Ibid.*, 239. [33] *Ibid.*, Part I, 557. [34] *Ibid.*, 556. In his testimony before the Congressional Committee on the Conduct of the War, *loc. cit.*, Colonel Pleasants complained that the plan received inadequate support from those above General Burnside. [35] *Ibid.* See, also, *ibid.*, 31.



SECTION OF MAIN GALLERY.

0 1 2 Ft.

DETAIL OF THE TUNNEL CONSTRUCTION
(*Official Records*, Vol. XL, Part I)

Meanwhile, the Confederates had become suspicious.[36] As early as July 11, 1864, Major General B. R. Johnson, advised a listening gallery "to ascertain if the enemy were mining." [37] This gallery was begun on the following day. [38] Shaft No. 1, of the Confederates, at Pegram's salient, the exact location threatened, was completed by July 13, 1864, several days before the main gallery of the Union mine reached the salient at a lower level. On the following day, another shaft, at the same salient was completed.[39] From these two shafts and a third at Colquitt's salient nearer the Appomattox River, galleries were extended laterally.[40] In turn the Union authorities became aware of the Confederate counter-mining, getting the information from deserters.[41] Pleasants says in his official report: "The enemy having obtained some knowledge of the mine, and having commenced searching for it, I was ordered to stop mining, which was, however, resumed on the 18th of July by starting the left lateral gallery." [42] Of this final development of the mine, only a careful drawing would surpass in definiteness the report of Pleasants as follows: "At 6 P. M., July 18 commenced the right lateral gallery; but as the enemy could be heard very plainly working in the fort over us, I caused this gallery to be excavated a little beyond and in rear of their work, and gave to it a curved line of direction. The left gallery, being thirty-seven feet long, was stopped at midnight on Friday, July 22; the right gallery, being thirty-eight feet long, was stopped at 6 P. M., July 23."[43] He continues his report with information: "The mine could have been charged and exploded at this time. I employed the men, from that time, in draining, timbering, and placing in position eight magazines, four in each lateral gallery." In this last stage of actual mining, the Union miners heard Confederate countermining, and at the same time the Confederates could hear the picking of the Union workmen, although they were not sure of this. [44]

About July 25, 1864, when danger along the Potomac appeared no longer serious, and while the last touches were being applied to the excavation of the

[36] *Ibid.*, 38, Dana to Stanton, July 6, 1864. Deserters from the Union Fifth Army Corps probably gave the information. See *Report of the Joint Committee on the Conduct of the War, loc. cit.* E. P. Alexander in his *Military Memoirs of a Confederate* (New York, 1907) p. 563 claims he suspected the mine as early as June the thirtieth.

[37] *Ibid.*, Part III, 765. [38] *Ibid.*, 771, 772. [39] *Ibid.*, 774.

[40] *Ibid.*, 765 f. Alexander, *op. cit.*, p. 565 asserts that the Confederates failed to strike the Union mine, because, in addition to its depth, it ran under the center of the salient, whereas the Confederate countershafts were at the sides.

[41] *Ibid.*, 301, Burnside to Williams, July 17, 1864. [42] *Ibid.*, Part I, 557.

[43] *Ibid.* See, also, *ibid.*, Part III, 336, 337, 351, 354, 369. This part of the mine has been opened up to the public in recent years. An extraordinary feature is revealed which is not noted in contemporary documents of the time of the campaign. To escape detection by the Confederates, the mine shaft was given a downward incline to the left at an angle of forty-five degrees and carried forward the desired distance. Then a shaft was dug upwards and work begun again on a higher level. The ladder used in reaching the higher level on which the galleries were located was found recently and is preserved in the local museum.

[44] *Ibid.*, Part III, 790. Curiously the Confederates thought they heard picking at Colquitt's salient over a mile distant from Pegram's or Elliott's salient.

mine, Grant began a series of attacks on the Confederates; first south of Petersburg, towards the Weldon railroad; and then, slightly later, north of the Appomattox River and even north of the James River in the neighborhood of Malvern Hill. Under the circumstances, and from the records, it is fairly evident that these movements were feints intended to draw the main body of the Confederate forces away from their threatened intrenchments immediately in front of Petersburg.[45]

The last week in June and the first three weeks in July 1864 were accompanied by the raids and other alarms which accompany warfare. But to Lee, in command of the Confederate operations against Grant, the month following the first disastrous assaults of the Army of the Potomac upon Petersburg must have been a time of relief, a period of reaction from the severe fighting of the previous six weeks. The sharp repulse and heavy losses of the Union forces in the early assaults when faced by only a few thousand defenders of the city, gave Lee sufficient confidence to dispatch a part of his forces against Washington, D. C., which had been largely stripped of its protective forces. On the defensive in front of Richmond and Petersburg, Lee took the offensive in the Shenandoah Valley and along the Potomac. The disturbance which this movement caused in Union circles has already been noted. If the move accomplished nothing more, it served to demoralize the plans of Union attack in central Virginia. Lee, in the light of results, was satisfied that behind his intrenchments, he could, even with greatly reduced forces, face attack by superior forces without much danger. In fact he hoped for further Union assaults and regretted that they were not made.[46]

When, therefore, in the fourth week of July, Grant moved the bulk of his forces north of the Appomattox River, and much of them north of the James River, Lee countered the movement by pushing north the larger part of his veterans, leaving behind in the trenches of the Petersburg sector only three divisions.[47] Of these the division of General William Mahone of the Third Corps of the Army of Northern Virginia occupied the Confederate right to the south, while the center and left of the line respectively were held by the divisions of Major Generals Bushrod R. Johnson and Robert F. Hoke, two divisions from the department of North Carolina and Southern Virginia which had been hurriedly brought up in May to meet the threat of the Union Army of the James.

Upon these three divisions, numbering probably about twenty-one thousand troops,[48] rested the defense of the Confederate line south of the Appomattox River. In addition they had to be on guard against the threatened mine explosion, a danger already apprehended by Confederate commanders, whose efforts to frustrate the plan of the Union mine failed only because the Confederate countermining was not deep enough at the point threatened.[49]

[45] *Ibid.*, 437, 438, 439, 461.
[46] *Ibid.*, 762.
[47] *Ibid.*, Part I, 57, 82, 791.
[48] *Ibid.* Part II, 707.
[49] *Ibid.*, Part III, 765 f.

Pegram's salient, or, as it was sometimes designated, Elliott's salient, was, in military terminology, a re-entrant salient lying almost due east of Petersburg.[50] It could be defended by enfilade or cross-fire from the trenches of the other parts of the Confederate line to the right and left.[51] To further strengthen this salient, a second line, or trench cavalier, had been thrown up from 150 to 200 yards in its rear, commanding both the Confederate advance intrenchments and the enemy's works at a distance.[52] This trench cavalier was begun as early as the fourth of July.[53] On July 6, 1864, C. A. Dana in a message to E. M. Stanton, reported: "Some prominent officers say that the enemy is aware of the mine and has constructed a new line within that he (Burnside) means to blow up."[54] B. R. Johnson reported July 10, 1864, the partial completion of a third line of intrenchments in the rear of Pegram's battery.[55] Writing many years afterward Judge Thomas R. Roulhac of the 49th North Carolina Infantry, C. S. A., stated: "Most fortunately for our army we had completed but a day or two before [the mine explosion] a cavalier line in the rear of the salient where the explosion occurred; the two lines salient and cavalier forming a diamond shaped fortification."[56] As an additional defense, a concealed battery was planted in a well-protected spot on the north of Pegram's salient from which the area around the threatened point could be swept with grape and canister.[57]

In the light of these Confederate preparations, not unobserved by the Union forces, Meade requested on July 24, 1864, "a little more time" than was given by Grant in a letter of suggestions on that day, a view in which Grant acquiesced.[58]

Under the circumstances Grant on July 25, 1864, decided upon the use of the mine for an attack, but only after the manoeuvers and *ruses de guerre* already mentioned. His message to Meade stated:

> You may direct the loading of the mine in front of the Ninth Corps. I would set no time when it should be exploded, but leave it subject to orders. The expedition ordered may cause such a weakening of the enemy at Petersburg as to make an attack there possible, in which case you would want to spring Burnside's mine. It cannot be kept a great while after the powder is put in. I would say, therefore, if it is not found necessary to blow it up earlier, I would have it off during the afternoon of Wednesday.[59]

On July 26, 1864, orders went out for 8,000 pounds of blasting powder and 3,000 feet of fuse.[60] In response to a request from Meade, a preliminary plan for

[50] See map, *Battles and Leaders*, IV, 538, and maps in *Atlas to Accompany the Official Records*, etc., as indicated in footnote 4.

[51] *Ibid.*

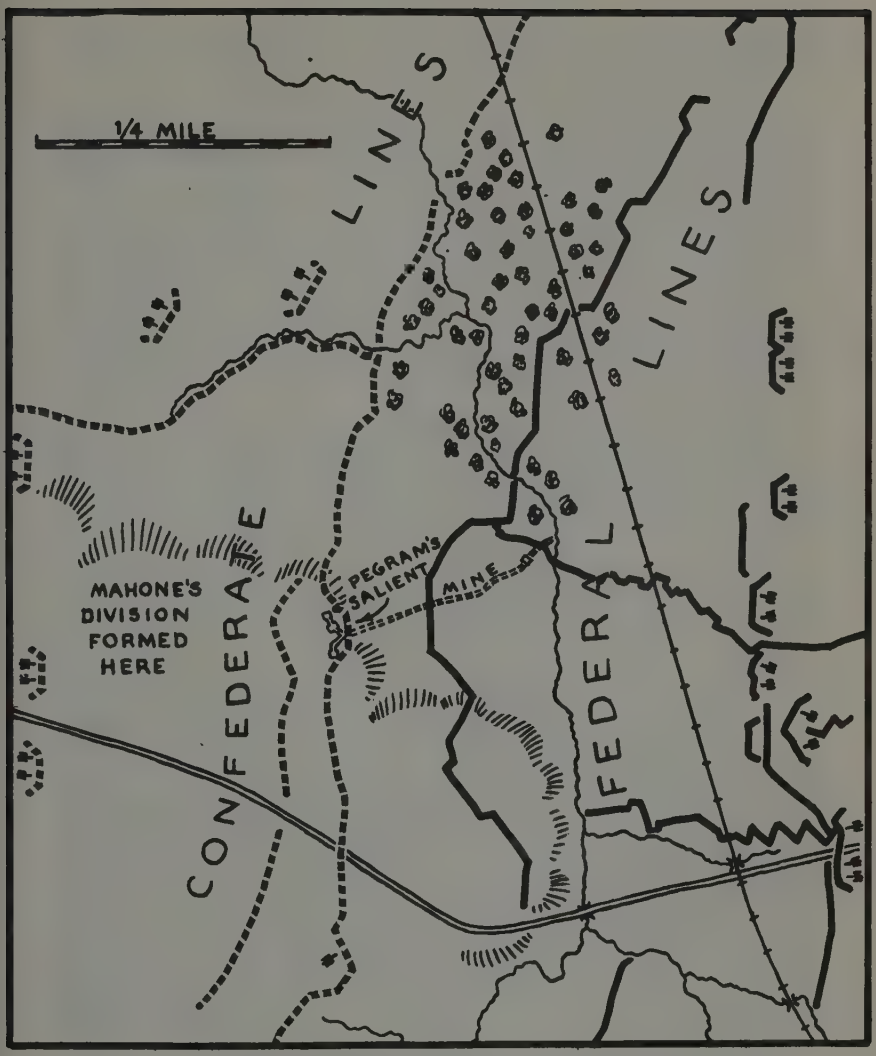
[52] *Official Records*, Vol. XL, Part I, 788. [53] *Ibid.*, 775, Foote to Brent, July 4, 1864.

[54] *Ibid.*, 34. [55] *Ibid.*, 778.

[56] *Southern Historical Society Papers*, XXXII (1895), 72. See also, *Official Records*, Vol. XL, Part III, 372, 387, 414, 425, 440, 441, 458, 477-478.

[57] *Official Records*, Vol. XL, Part I, 759, 789. [58] *Ibid.*, Part III, 425-426. [59] *Ibid.*, 438.

[60] *Ibid.*, 463.



POSITION IN THE VICINITY OF THE CRATER

Based on Contemporary Map and Sketches

the mine explosion and the accompanying attack was submitted by Burnside on this date.[61]

It was at 7:45 P. M. on July 26, 1864, that General Burnside received the message from Meade's Chief of Staff: "The commanding general directs that you prepare your mine at once for explosion, but that you await further orders before springing it."[62] The powder for charging the magazines of the mine was evidently ready at 10 A. M. on Wednesday, July 27, 1864.[63] At 4 P. M., the work of carrying the powder into the mine was begun,[64] and at 9 P. M. Burnside notified Meade that Colonel Pleasants had reported that the right lateral gallery was charged and that the left lateral gallery would be charged by 11 o'clock and the tamping completed by 4 A. M. Actually the loading was completed an hour early at 10 P. M., but the tamping took fourteen hours longer, not being completed until 6 P. M. on Thursday, July 28, 1864.[65]

The mine was ready, therefore, to be fired. Burnside at 9 P. M. sent Meade the message: "The mine is completed and ready for springing."[66] But military preparations for the attack which was to accompany the explosion of the mine were yet incomplete. A large part of the Union forces were still north of the James River. It was Grant's plan to get his entire army of 65,000 troops in place for a general assault all along the Petersburg front, in case a break through the Confederate intrenchments should result from the explosion of the mine.[67] This return of the Union forces was under way on Friday, July 29, 1864, but the movements were not completed until late in the night.[68]

In the Union plan of operations, responsibility for the assault following the mine explosion was placed upon the Ninth Army Corps under Major General Burnside. Support was to be furnished by the Fifth Army Corps on the left, under Major General G. K. Warren, and the Eighteenth Army Corps, on the right, under Major General E. O. C. Ord. Burnside originally planned to use, as the vanguard of the attack, his Fourth Division, a body of negro troops commanded by Brigadier General Edward Ferrero.[69] His reason for this was that the white troops of his other three divisions had suffered considerable losses in the past six weeks, were trench-weary and had lost the spirit of attack.[70] Special drill was given to the Fourth Division for the unique role it was expected to play.[71] But Burnside's plan to use negro troops in launching the attack was over-ruled. Meade

[61] *Ibid.*, 476.
[62] *Ibid.*, 479.
[63] *Ibid.*, 526.
[64] *Ibid.*, Part I, 557.
[65] *Ibid.*
[66] *Ibid.*, Part III, 566.
[67] *Ibid.*, 591-635.
[68] *Ibid.*, See, especially, statement of Hancock, *ibid.*, 648.
[69] *Ibid.*, 473, 476.
[70] *Ibid.*, Part I, 58, 524.
[71] *Ibid.* See also, testimony of General Ferrero, December 20, 1864, before the Joint Committee on the Conduct of the War, *loc. cit.*, 106, where he says he had drilled his troops "for over three weeks."

disapproved of calling upon negro troops to do such important work.[72] This disapproval Burnside protested in a conference on Thursday, July 28, 1864,[73] and the matter was submitted to Grant.[74] On Friday, Burnside was notified that Grant likewise disapproved. This information was probably given orally. It was also furnished in writing in the following letter of 10:15 A. M., from Meade's Headquarters: "I am instructed to say that the major-general commanding submitted to the lieutenant-general commanding the armies your proposition to form the leading columns of assault of the black troops, and that he, as well as the major-general commanding, does not approve the proposition, but directs that those columns be formed of the white troops."[75]

It was necessary, therefore, on the afternoon of the last day before the attack, to reorganize the plan, so that the Fourth Division would be in reserve instead of in advance. According to the testimony of Burnside before the later court of inquiry, he called into consultation the commanders of his three divisions of white troops, Brigadier General Orlando B. Willcox of the Third Division, Brigadier General Robert B. Potter of the Second Division, and Brigadier General James H. Ledlie of the First Division.[76] Decision of the order of attack was, after some discussion, determined by lot and Ledlie and the First Division drew the advance.[77]

In accordance with the measures thus far determined upon, Burnside, late in the afternoon of Friday, July 29, 1864, put out a circular of instructions.[78] The attack was to be made immediately after the explosion of the mine. General Ledlie of the First Division was instructed to rush his troops through the breach in the Confederate defenses made by the mine explosion and advance them at once to the crest of the hill beyond. General Willcox of the Third Division was ordered to follow as soon as possible and move to the left beyond the Confederate line and endeavor to advance to the southwest. General Potter of the Second Division was directed to follow the Third Division as soon as possible and move to the right beyond the Confederate front line and endeavor to advance to the northwest. General Ferrero, of the Fourth Division, composed of negro troops, was instructed to hold himself in readiness to advance to the assistance of the First Division and pass on into the city. It was the plan of Burnside to throw virtually the entire Ninth Army Corps of nearly fifteen thousand men upon the weakened and disorganized Confederates, after the explosion of the mine. In addition, General Warren in command of the Fifth Corps was expected to advance on the Union left and General Ord of the Eighteenth Corps upon Burnside's right,

[72] *Ibid.*, 46, 60, 165, 524. Note the very significant testimony of General Grant before the Joint Committee on the Conduct of the War, *loc. cit.*, III, that General Meade feared public disapproval of putting negro troops in so dangerous a position.

[73] *Ibid.* [74] *Ibid.* [75] *Ibid.*, 137, and *ibid.*, Part III, 608.

[76] *Ibid.*, Part I, 61. [77] *Ibid.* [78] *Ibid.*, 136; and *ibid.*, Part III, 611.

while even General Hancock, with the Second Corps, south of the Appomattox, and General Sheridan, with the Cavalry Corps far to the south, were expected to press upon the harrassed enemy.[79]

In his testimony before the court of inquiry, Burnside claimed that Meade modified this plan by ordering all the troops to rush for the crest,[80] and to some extent Meade's testimony bears this out.[81] But when, in his official report three days later, August 13, 1864, Burnside renewed the allegation,[82] Meade in his own official report denied the validity of Burnside's statement.[83]

The expectations of the Union commanders were probably mixed. Certainly they varied. At the Court of Inquiry on the Mine Explosion, held in the Union Army shortly afterward, Meade said that from the first he never considered that the location of Burnside's mine was a proper one.[84] In fact Meade had lost his enthusiasm for the matter very early. On July 8, 1864, C. A. Dana sent the message to E. M. Stanton: "General Meade reports that Burnside's mine will prove of no value." [85] Warren, in his testimony, said he never saw sufficient good reasons why the attack should succeed, that he never had confidence in its success.[86] Major J. C. Duane of the Engineer Corps said he did not think there was any reasonable chance of success by such an attack. And from the records, it is clear that the four division commanders and their troops were none too optimistic.

The time set for the explosion of the mine was 3:30 A. M.,[87] just before daybreak Saturday, July 30. Three fuse lines ran from the entrance of the mine to the point where tamping began. There they connected with powder troughs which were depended upon to convey the flash to the eight magazines. The fuse had been furnished in short lengths and much splicing had been necessary.[88] According to his official report, Colonel Pleasants lit the fuse at 3:15 A. M.[89] For an hour, officers and men awaited the expected explosion.[90] Requests for information concerning the delay brought none, for the simple reason that there was none available.[91] At 4:15 A. M., Lieutenant Jacob Douty, of Company K, and Sergeant Henry Rees, of Company F, 48th Pennsylvania, volunteered to go into the main gallery to ascertain the cause of the failure to explode. [92] Finding that

[79] *Ibid.*, Part I, 134-135; and *ibid.*, Part III, 596.
[80] *Ibid.*, Part I, 62.
[81] *Ibid.*, 47.
[82] *Ibid.*, 527.
[83] *Ibid.*, 164-165.
[84] *Ibid.*, 45. In his testimony on January 13, 1865, before the *Joint Committee on the Conduct of the War, loc. cit.*, 113, Colonel Pleasants said, "I know this: that General Burnside told me that General Meade and Major Duane, chief engineer of the Army of the Potomac said the thing could not be done; that it was all claptrap and nonsense; that such a length of mine had never been excavated in military operations."
[85] *Ibid.*, 36.
[86] *Ibid.*, 78.
[87] *Ibid.*, 76.
[88] *Ibid.*, Part III, 553, 581, 596, 611.
[89] *Ibid.*, Part I, 557. See the testimony before the *Joint Committee on the Conduct of the War, loc. cit.*, especially the testimony of Colonel Pleasants, *ibid.*, 114.
[90] *Ibid.*
[91] *Ibid.*, 44-163, *passim;* and *ibid.*, Part III, 636-690, *passim* but especially 656-657.
[92] *Ibid.*, Part I, 62.

the fuses had burned out some distance from the entrance, owing to dampness and poor splicing, they relighted them about 4:30 A. M., and at 4:44 A. M. the mine finally exploded.[93]

The spectacle in the hazy dawn of the hot summer morning was awe-inspiring to all so situated as to see it. A Union officer writing at a later date described it as follows: "It was a magnificent spectacle, and as the mass of earth went up into the air, carrying with it men, guns, carriages, and timbers, and spread out like an immense cloud as it reached its altitude, so close were the Union lines that the mass appeared as if it would descend immediately upon the troops waiting to make the charge. This caused them to break and scatter to the rear, and about ten minutes were consumed in reforming for the attack." [94]

If to the Union troops who knew of the plans and had been under arms for nearly two hours, the explosion was terrifying, it is easy to picture the confusion in the already weakened Confederate lines. Four companies of the 18th South Carolina Infantry which held Pegram's salient, were shattered by the explosion and partly buried in the debris.[95] Many descriptions, most of them of a later date, have been made of the sight which greeted Union soldiers on their arrival at the crater. One of them saw "men buried in various ways—some with only their feet and legs protruding from the earth."[96] He said: "One of these near me was pulled out, and proved to be a second lieutenant of the battery which had been blown up. The fresh air revived him, and he was soon able to walk and talk. He was very grateful and said that he was asleep when the explosion took place, and only awoke to find himself wriggling up in the air; then a few seconds afterward he felt himself descending, and soon lost consciousness."[97]

In the trenches to the right and left of the place of explosion there was great

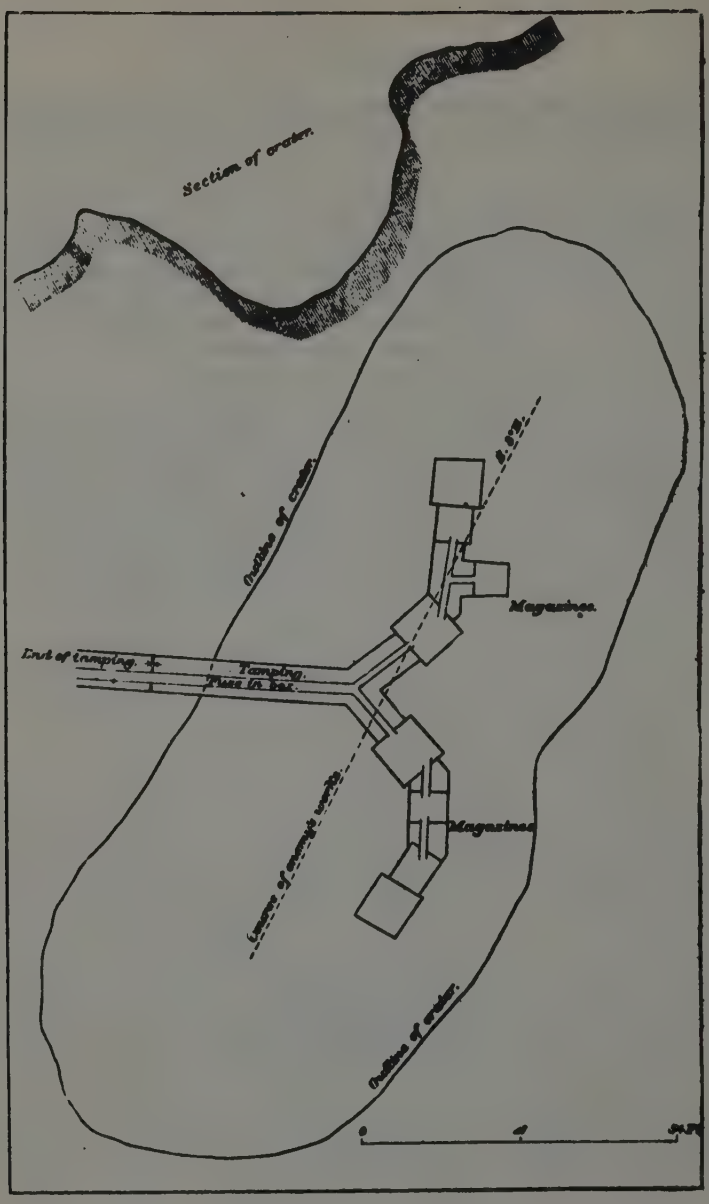
[93] *Ibid.*, 63, 557; *Report of the Joint Committee on the Conduct of the War, Battle of Petersburg,* 7, 115; *Harper's Pictorial History of the Great Rebellion* (New York, 1868), II, 696; Adam Badeau, *Military History of Ulysses S. Grant* (New York, 1881), II, 478, says "Lieutenant Doughty." Portraits of Douty and Rees can be found in Gould, *op. cit.*, 216 and 272. Somewhat strangely Lieutenant Douty is not mentioned in Volume XL of the *Official Records,* but he is indicated by the phrase "an officer," *ibid.*, Part I, 557.

[94] William H. Powell, Major, U. S. A., "The Battle of the Petersburg Crater," *Battles and Leaders,* IV, 551. For for two additional graphic descriptions, see (a) *Papers of the Military Historical Society of Massachusetts,* Volume V. *Petersburg, Chancellorsville, Gettysburg* (Boston, 1906), 205, a statement of Brevet Brigadier-General Stephen M. Weld, in a paper "The Petersburg Mine," read before that Society March 27, 1882; and (b) Michigan Pioneer and Historical Society *Historical Collections,* Volume XXX (Lansing 1906), 130, a statement of General Byron M. Cutcheon in a paper, "The Twentieth Michigan Regiment in the Assault on Petersburg, July, 1864."

[95] *Official Records,* Vol. XL, 17, 788; and *ibid.*, Part III, 636; also references in footnote 94 of this paper.

[96] William H. Powell, Major, U. S. A., "The Battle of Petersburg Crater", *Battles and Leaders,* IV, 551; Captain John Featherston "Graphic Account of Battle of Crater," in *Southern Historical Papers,* XXXIII (1905), 366.

[97] *Battles and Leaders,* IV, 551.



THE END OF THE MINE
(*Official Records*, Vol. XL, Part I)

temporary confusion, from which the bewildered men barely rallied in time to prevent disaster.[98] In later reports and testimony there is general agreement that for more than fifteen minutes after the explosion there was little Confederate fire either of musketry or of artillery.

Information as to the size of the crater varies greatly. Union and Confederate accounts disagree. According to the finding of the Union court of inquiry about the mine explosion, "the crater was 50 to 60 yards long, 20 yards wide and 20 to 25 feet deep" and "was about 500 yards from the cemetery crest."[99] Since the day of the explosion was one of great confusion and the attackers were driven out in the afternoon, this finding of the court is but an estimation. In his official report Major General B. R. Johnson of the Confederate forces stated: "The crater measures 135 feet in length, 197 feet in breadth, and 30 feet deep."[100]

Into this irregular hole, about five o'clock in the morning, the First Division of the Ninth Army Corps of the Union army rushed forward.[101] From the very beginning plans went wrong. Arrived at the crater the brigades of this division fell into confusion. By the time they had gone down into and again climbed out of the crater on the opposite side, the Confederates along the trenches had recovered and poured a deadly fire upon the flanks of the men preparing to rush for the crest beyond.[102] The advanced Union troops quickly fell back into the crater for protection. Again in the crater, they were picked off in their disordered formation by Confederate sharp-shooters.[103] In addition Confederate artillery soon opened upon the crater and the adjacent territory.[104] Wright's battery to the northwest of the crater, one gun in a battery to the southwest, and four mortars under Captain Lamkin on the Jerusalem plank road poured a deadly fire into the crowded mass.[105] The initial check had come from failure to mop up the Confederate troops in the trenches to the right and left of the crater.[106] Later trouble was accentuated by artillery fire.[107] In the language of the official report of a Union officer: "The crest of the fort was swept with canister and grape shot from the batteries of the enemy. In the meantime, the enemy opened a heavy bombardment with their mortar batteries. They had perfect range of the crater; therefore almost every shell exploded in the midst of the dense mass of men, killing and wounding many of our brave soldiers at every explosion." [108]

In the midst of this confusion the First Brigade of the Third Division advanced to the attack, expecting to move to the left of the crater. It reached the Confederate line of intrenchments and made an effort to clean out the Confederates to the south of the crater, but failed and the men fell back into the crater.[109] The first

[98] *Official Records*, Volume XL, Part I, 788-789. [99] *Ibid.*, 126. [100] *Ibid.*, 788.
[101] *Ibid.*, 536, 538, 541. [102] *Ibid.*, 526, 536, 538, 541. [103] *Ibid.*, 789, 791.
[104] *Ibid.*, 536, 759, 789. [105] *Ibid.*, 536, 791.
[106] *Ibid.*, 70, 79, statements of Generals Burnside and Warren.
[107] *Ibid.*, 759. [108] *Ibid.*, 555. [109] *Ibid.*, 574.

Brigade of this division made a frontal attack against the Confederate rifle pits on the left of the crater,[110] but some of the regiments broke and fled back to the Union front line, while the others sought safety in the Confederate intrenchments.[111]

In the meantime the Second Division likewise advanced, expecting to move to the right of the crater. But several regiments, in the advance, overlapped the crater and, caught in a withering fire of grape shot and canister which swept across the crater, sought refuge in the already crowded hole.[112] Other regiments moved on to the right and attempted to mop up the Confederate trenches to the north and even to advance to the crest of the hill beyond, but were driven back into the Confederate trenches or into the crater.[113]

Two hours of unavailing effort had now passed. The surprise, or *coup de main,* insisted upon by Meade as an essential feature of success,[114] had really failed. Nevertheless, under an order from Meade to rush forward all his divisions,[115] Burnside, about seven o'clock in the morning, sent forward the Fourth Division of negro troops.[116] In column by left flank the negro regiments, with one exception, moved forward rapidly, going around or through and across the crater, and advanced to the open ground beyond in the direction of the crest of the hill. There they met with infantry resistance and, coming under galling artillery fire from the flanks, fell back in disorder, some into the crowded crater and some all the distance to the Union lines.[117] In this retreat they were raked by rifle and artillery fire and fell in great numbers.[118]

The failure of the negro troops ended the hope of Union success. The Battle of the Crater was already lost. Had the Confederates been more assured, they might have refrained from infantry counter-attacks and saved many lives. Their artillery was playing havoc with the Union troops in the crater.[119]

By nine o'clock Grant and Meade recognized that the enterprise was a failure.[120] Shortly later Meade gave positive orders for the withdrawal of the Union troops from the crater.[121] Fairly good proof that Grant never had high expectations of a satisfactory result may be seen in the fact that before the mine explosion he had made an engagement to meet President Lincoln at Fort Monroe on the morning of the following day.[122]

[110] *Ibid.*, 574, 575, 586. For a later statement of the commander of this brigade, see *Michigan Pioneer and Historical Society, Historical Collections,* XXX, 130.
[111] *Ibid.*, 575, 586-587. [112] *Ibid.*, 528, 547, 567. [113] *Ibid.*, 528, 547-548, 550 f.
[114] *Ibid.*, 47, 94, 170. [115] *Ibid.*, 141, and especially, *ibid.*, Part III, 658 f.
[116] *Ibid.*, Part I, 64, 528. [117] *Ibid.*, 73, 528, 597, 599. [118] *Ibid.*, 597, 599. [119] *Ibid.*, 555.
[120] *Official Records* Vol. XL, Part I, 48, 144, 170, 529; and *ibid.*, Part III, 662.
[121] *Ibid.*
[122] *Ibid.*, Part III, 551, 590, 636. Grant did not confirm this appointment to meet Lincoln until 10:30 A. M. July 30.

To Burnside in command of the Ninth Corps, every single man of which according to his testimony before the court of inquiry had been put in action, [123] withdrawal at once seemed undesirable if not impossible. [124] His idea was that withdrawal could best be made after the day was over.[125] He therefore gave orders for withdrawal but left the appropriate time to the discretion of the commanding officers in the crater.[126]

It was hardly less difficult, however, to remain in the crater than to withdraw. The Confederate artillery continued to take deadly toll. Burnside on the following day reported that losses in his corps in the engagement amounted to about 4,500. A great proportion of the loss occurred after the brigade commanders in the crater were made aware of the order to withdraw.[127]

Two other dangers threatened the troops huddled in the crater. One of these was suffering and prostration from intense heat and thirst.[128] It was late in July, the day was clear and the heat of the sun was almost unbearable. To this was added the body heat of the mass of men in the crater.[129] Water was lacking and the wounded, particularly, suffered from thirst. [130]

The final danger to those in the crater came from Confederate counter-attacks. The Union attack had been checked by "little more than three regiments of Elliott's, two regiments of Ransom's and two regiments of Wise's brigades, with the efficient aid of artillery." [131] The men crowded into the crater were soon threatened by active counter-attacks. Within an hour after the explosion General Lee was notified. He ordered a concentration at the threatened point and hurried to the Gee house on the Jerusalem plank road, from where, directly behind the crater, he had an open view of the scene and could direct the defense. From the already weak Confederate forces along the lines, brigades were drawn together for assault on the enemy in the crater. [132] They were withdrawn from the works in such a manner as not to be seen by the enemy, leaving the space which they had covered, unoccupied except by a few skirmishers stationed in the works at twenty paces apart. [133] In much the same way that they were withdrawn from

[123] *Ibid.*, Part I, 67. [124] *Ibid.*, 65. [125] *Ibid.*, Part I, 65, 529; and *ibid.*, Part III, 662.
[126] *Ibid.*, 65; and, *ibid.*, Part III, 662, 663. [127] *Ibid.*, Part III, 705.
[128] *Official Records*, Vol. XI, Part I, 529, 551, 555. [129] *Ibid.* [130] *Ibid.* [131] *Ibid.*, 791.
[132] *Ibid.*, 791, 792, Alexander, *op. cit.*, p. 571; Humphreys, A. A., *Virginia Campaign of '64 and 65* (New York, 1883) p. 259; *Papers of the Military Historical Society of Massachusetts*, Volume V, *Petersburg, Chancellorsville, and Gettysburg; Historical Collections* of the Michigan Pioneer and Historical Society, XXX (1906). Except for the detailed report of Major General B. R. Johnson and less thorough reports of a few other Confederate officers, contemporary Confederate information of the battle is lacking. Magazine articles at a later date written by former Confederate officers must be used.
[133] Captain John C. Featherston, "Graphic Account of Battle of Crater," in the *Southern Historical Society Papers*, XXXIII (1905), 360. But note the statements of Captain Charles H. Porter, "The Petersburg Mine," in *Papers of the Military Historical Society of Massachusetts*, V, 233 f., that Union soldiers were aware of what was being done.

the works, these brigades were moved forward for attack upon the Union soldiers in the crater and in the old Confederate trenches to the right and left of the crater.[134] During the heat of the day three Confederate counter-charges were made. [135] Though some of the regiments in these charges came from other divisions, the majority of them belonged to the Virginia, Alabama, and Georgia brigades of Mahone's division. [136] In the first two charges the Confederates re-occupied part of their old intrenchments but were unsuccessful in their effort to take possession of the crater. [137] In the third and final counter-charge by Sander's brigade of Mahone's division, advance was made into the crater itself where after terrific hand to hand fighting, all Union troops who failed to reach the Union lines were either killed or captured.[138]

An interesting fact in connection with the assaults of the Union troops, as was fully brought out in the Court of Inquiry on the Mine Explosion, [139] is that only brigade commanders accompanied the advance against the Confederate lines. The division commanders remained behind in the Union intrenchments. This was a matter of great significance, for it left the brigades without immediate co-ordination and direction from superior command. Among the causes of failure the court of inquiry cited "the want of a competent common head at the scene of the assault to direct affairs as occurrances should demand,"[140] and three of the division commanders of the Ninth Army Corps were declared answerable for the want of success.[141]

At 6:30 P. M., on the day of the explosion, Saturday July 30, 1864, Lee reported to the Confederate War Department that General Mahone in retaking the salient had recovered the four guns with which it was armed, captured 12 stand of colors, 74 officers, including Brigadier General Bartlett and staff and 855 enlisted men,[142] to which he added the remark: "Upward of 500 of the enemy dead are lying unburied in the trenches," concluding with the statement that Mahone's loss was slight. Two days later Grant reported to the government at Washington that "the loss in the disaster of Saturday last foots up about 3,500 of whom 450 men were killed and 2,000 wounded," adding as a summary conclusion of the episode: "It was the saddest effort I have witnessed in the war."[143] Actually the Union losses were 458 killed, 1,982 wounded and 1,960 missing, or a total of 4,400. [144]

On the Confederate side the losses were not by any means negligible. Major General B. R. Johnson reported the losses of his division as 19 officers and 149

[134] *Ibid.*
[135] *Official Records*, Vol. XL, Part I, 753, 791, 792.
[136] *Ibid.* See, also, *Southern Historical Society Papers*, XXXIII (1905), 360.
[137] *Official Records*, Vol. XL, Part I, 791, 792.
[138] *Ibid.*, 792. [139] *Ibid.*, 71, 74, 91, 93, 98, 103, 105, 113, 115, 116, 118, 128, 129.
[140] *Ibid.*, 127, Potter accompanied his troops. [141] *Ibid.*, 128, 129.
[142] *Ibid.*, 753; and, *ibid.*, Part III, 818. [143] *Ibid.*, Part I, 16. [144] *Ibid.*, 167.

men killed, 33 officers and 362 men wounded and 14 officers and 349 men missing or a total of 922.[145] Of this loss the greater part occurred in Elliott's brigade in occupation of the Confederate lines attacked, which as a result suffered heavily from the explosion itself, from the first savage attack, and from captures made early in the day.[146] If to the official losses of this division be added those of Mahone's division it is reasonable to suppose that the total Confederate losses amounted to at least 1,500 or about one third of those of the attackers. Considering the small number of Confederate troops south of the James River at the time such a loss was at least temporarily serious.

Apart from its interest as an episode this battle was significant in the campaign. It proved for the third time in two months that direct assault upon intrenchments was not only unavailing but likely to result in grave disaster. It meant six months of trench warfare in front of Petersburg and a war of attrition in which superior resources in men and the supplies of war must eventually triumph. By the spring of 1865 this eventual triumph was apparent to all.

[145] *Ibid.*, 793, Alexander, *op. cit.*, p. 573, calculates the total Confederate losses at from 1,400 to 1,500.
[146] *Ibid.*, 788, 790, 791, 793.

PORTRAIT OF AN ADJUTANT GENERAL

The Career of Major General Fred C. Ainsworth

By Siert F. Riepma



IN THE eighteen-seventies and eighties it was easy to see that the United States government was not the simple instrument of agrarian democracy it had appeared to be before the Civil War. The war itself, and the economic growing pains which ensued, had brought about an increase in government services far beyond the prudent limits of previous generations. Nowhere was this change more apparent than in the War Department, charged with the double duty of policing the South during reconstruction and expediting the settlement of the West. When Congress, in 1879, began to pass large-scale pension legislation for Civil War veterans, the War Department, through its Surgeon General's and Adjutant General's Offices, had to shoulder the unprecedented burden of investigating the military history of each of thousands of pension applicants. New techniques had to be developed for the more efficient management of the great quantities of military records which had to be consulted in connection with the pension business, and for the handling of a huge pension correspondence. Out of this necessity there came a new method of organizing the materials of army history and, with it, an extraordinary career.

For seven years after the legislation of 1879 the Record and Pension Division of the Surgeon General's Office struggled desperately to cope with the tide of applications. Each would-be pensioner's claim was sent over by the Pension Bureau for verification of alleged disabilities, and an average case required arduous searches through hospital books, reports of sick and wounded, and similar records—searches which not infrequently lasted for months, sometimes over a year. No solution to this deplorable situation could be settled upon other than asking Congress for additional clerks. And there was reason enough why Congress complied, for each

senator and representative had his sheaf of constitutents' pension inquiries. The addition of personnel, however, only made a bad arrangement worse; for the letter books then in use so centralized the function of handling correspondence, and the established routine of filing and searching was so inadequate to large-scale operations and so confusing of responsibilities, that efficient distribution of the work was impossible. With thousands of arrears of cases piling up each year against the barrier of an antiquated archival system, the morale of the division sank low enough to become a matter of concern on the part of the Secretary of War himself. This concern was not diminished by reports of headway made against back work after the first rush had passed.

Certain congressmen, with the far-sightedness natural to their position, looked ahead to the next pension law, considered the bad effect on elections of large federal payrolls, and felt that drastic reforms in record-keeping were in order. War Department officials, too, shook their heads pessimistically over the rate at which records were being worn out by the constant handling they received; a separate force of assistants was kept busy merely copying and repairing manuscripts.

All this came to a sudden end when, in December, 1886, the Surgeon General appointed Captain Fred Crayton Ainsworth to lead the way out of the archival wilderness.

Just why Ainsworth was selected, neither documents nor memories reveal. He was, however, no unknown quantity. Perhaps his name had originally been suggested by friends at the capital or in the War Department. It is very probable that his services as recorder of the Army Medical Board in New York had attracted attention. Be that as it may, little is known of any part of Ainsworth's life up to this time. Born in a Vermont village in 1852, he had graduated from the New York University Medical School in 1874, and shortly thereafter, against the counsel of an instructor, had accepted an appointment in the army as assistant contract surgeon. Five years later he had attained the rank of captain. He appears to have preferred the more active existence of field service to that of the hospitals, and this part of his life had been spent mostly in the West. In usual peripatetic army fashion Ainsworth had visited West Point, Vancouver, Sitka, Yuma, and Camp Grant, Arizona, in turn.

These were the years of the most active Indian fighting in the Southwest. Although Ainsworth was to testify publicly that he had been entirely connected with staff work and had never had any "active experience" in the line, his Western career was apparently one of mixed vocations. At any rate he earned a reputation for being a doctor who never refused to call and a soldier who understood the art of chasing Indians as well as any. There is little doubt that he was on the ground in many engagements (he once wrote a detailed account of a phase of the Geronimo campaign), and that he could tell frontier tales with the best of them.

Five more years were spent at various posts in Texas (he was married in San Antonio), then he came east to become recorder of the Army Medical Board. Here Ainsworth seems to have made his first venture into the mysteries of office-work and the Washington bureaucracy. Then, in December, 1886, he came to the capital as the new chief of the SGO Record and Pension Division. For assets he enjoyed the goodwill of a few congressmen interested in administrative reform, the recommendation of the Surgeon General, and the blessing of Secretary of War Endicott.

Into the close environment of offices and paper-work routine Ainsworth fitted with marvelous perfection. His very presence bore an atmosphere of self-assurance; with a large and powerful physique, his strong shoulders, long head, sharp glance and erect carriage gave an impression of ability and confidence. Both these attributes he certainly possessed, plus the very useful ones of a strong will and a driving ambition. There was, indeed, very little rule of thumb in the Ainsworth makeup. His astute and thoroughly pragmatic mind delighted in the ordered finiteness of administrative machinery. He liked to devise new ways of making that machinery run efficiently and as responsively to his touch as the most delicate engine. There was in him, moreover, a fundamental conservatism which prevented his overstepping the departmental traditions, and with this he possessed two hallmarks of the true bureaucrat: a passion for habitual procedure and an abiding belief that he must be the axis about which his whole sphere of authority should revolve. In due time it could truly be said that the Record and Pension Division was Ainsworth.

His personality helped him attain his ambition. A man of endless controversies, he yet enjoyed the warmest friendships; he was agreeable to those whom he favored but implacable toward those with whom he differed or whom he disliked. There are revealing stories still afloat about the pleasure he took in the company of his friends and in exchanging reminiscences with them; and just as many about his sharp personal conflicts with both underlings and superiors.

In four months Ainsworth had swept away the arrears of business which had cluttered up the SGO Record and Pension Division (he declared these amounted to nearly 10,000 investigations of soldiers' claims). Congressmen were pleasantly amazed to find their requests for information were being answered promptly and fully. It seemed a revolution.

This revolution was effected by application of factory methods to work previously carried on under a handicraft system. The letter book, that venerable army institution and bottle neck of correspondence, was abolished in favor of a card register and card index—devices which enabled any number of clerks to process correspondence at the same time. Filing and searching were made matters of methodical office procedure on the principle of division of labor, instead of being

left to the vagaries of individual clerks handling particular cases in their entirety. An express messenger service was set up to move papers through the various offices with the speed and surety of a belt conveyor. Each case was handled by a sort of straight-line process, never stopping for long on any one desk. And, as if to complete the analogy with contemporary industrial progress, Ainsworth required his clerks to work overtime.

But this was only the beginning, and Ainsworth's next stroke was the most successful of his career. The clearing away of arrears was but his first task; there remained the problem—the most important problem of all—of preserving the records under his care. These records, which were often composed of inferior paper and which had as a rule been exposed to the haphazard storage conditions of wartime, were "in tatters and fast crumbling away." Copies, and copies of copies, had in turn fallen apart from excessive use. The expense of reproduction by printing was prohibitive, while photography had not yet been sufficiently perfected to be of practical aid.

Ainsworth's response to this emergency was what he called the "index record card," so named because it was a rectangular piece of heavy paper bearing an extract from the record of a soldier and capable of being filed in index fashion. Each entry pertaining to a soldier in the original documents of military service or hospital care was copied on a separate card, and all the cards pertaining to the same man were assembled. The cards were then placed in paper jackets, one for each individual, and the jackets filed by army units and personal names. Tedious searching for all parts of a soldier's record was thus made a thing of the past; the desired information could be had by turning out the proper jacket, with its packet of cards, once the soldier's name was established. Original rolls and books could be kept out of active use. The volunteer army records of the War Department were, in fact, by this system literally made available in an effective way for the first time.

Nothing like it had ever been seen before, and Congress was delighted. It was estimated by the inventor, years afterwards, that the government had saved thousands of dollars in clerical salaries and increased efficiency through the beneficent operation of the index record cards, for of course their use made unnecessary the employment of a great many searchers. The Grand Army of the Republic, too, was gratified to learn that many new cases of pensionable disabilities were uncovered in the process of carding. Only the clerks, who objected to the severe Ainsworth system of rewards and punishments, and who anticipated the loss of their jobs, seemed unsatisfied.

Ainsworth's remarkable rise to the position of Adjutant General began with this successful innovation. He could now give members of Congress important information about soldiers' claims within a maximum period of three days; and he was always prepared to do favors for hard-pressed legislators. Senator F. M.

Cockrell, of Missouri, one day brought in a constituent's request for a service record. Not having time to wait, the Senator arose to leave. Ainsworth told him to take out his watch, left the room, and returned in five minutes waving the specified record in triumph. This typical Ainsworthism marked a lasting intimacy, for Cockrell became one of Ainsworth's most enthusiastic supporters. It was also typical of the cooperation (often of a personal character) that existed between Congress and Ainsworth.

The index record card may not have been a completely new thing, and the idea for it may not have been all Ainsworth's (a clerk had suggested something like it a good while before, and Cockrell himself was said to have urged it upon his friend), but his management of the innovation certainly made it seem so. It was a great success from the beginning. Eventually about sixty-two million cards were made, covering the service of American volunteer soldiers from the time of the Revolution. Here was, in effect, a brand-new War Department archive, of immense size and usefulness, on the basis of which Ainsworth speedily became indespensable to anyone who needed the information contained in it.

Recognition was not long in coming. Ainsworth had now begun the steep climb to the Adjutant Generalcy; but for another ten years he was primarily record-keeper and was rewarded as such. For his compensation Congress made itself responsible. At the very time the index record card made its appearance, and the quarter-century task of compiling soldiers' biographies was getting under way, a harrassed Congress had been moved to bring order out of the pension chaos. In March, 1887, the Senate appointed a special committee, headed by Cockrell, to investigate the methods of doing business in the executive departments and to inquire into "the causes of the delay in transacting the public business said to exist in some of the Departments." The committee (which was mostly concerned with the War, Interior and Treasury Departments, each heavily involved in pension administration) enthusiastically endorsed Ainsworth's magic cards and his ambitious plans for transcribing every available scrap of information about each United States volunteer soldier who had ever existed. It was the first authentic sign of what was soon to be Ainsworth's tremendous prestige with Congress, a prestige which continues after him, in attenuated form, to this day.

Nevertheless, the chief of the SGO Record and Pension Division was never one to seek publicity; and thus it was that when a movement was started to further his reforms by creating a new and comprehensive office for the preservation of all the inactive archives in the War Department, the campaigning was carried on chiefly within legislative committee rooms. Ainsworth exercised some influence, naturally; he was fond of directing affairs of this kind from the fastness of his office after the manner of a commanding general; but his hand was usually discreetly out of view. The Ainsworthites began their campaign by writing into the

deficiency appropriation bill of 1889 an authorization for the merging of the record-holding divisions of the Adjutant General's and Surgeon General's Offices. This move was on sound ground, for it was based on the recommendations of the business methods committee; it was therefore not inaccurately described as a step toward scientific management. Accordingly, in the following July, two general orders combined eleven divisions of the AGO with the SGO Record and Pension Division to form a Record and Pension Division of the War Department. Ainsworth was placed at the head and provision was made for transferring idle clerks to accelerate the business of carding.

In late 1891 more definite steps were taken. A bill was introduced to make the new Division into a Record and Pension Office, providing also that Ainsworth was to be made chief and to be given the rank of colonel. This meant that a quasi-independent bureau of no mean size was to take charge of army records, while its head was to receive advanced rank by legislative fiat, outside the regular channels of advancement. The proposition evoked the first of many storms in Ainsworth's Washington career. "It is a very novel proposition," warned Senator John Sherman, "to make an officer of the Army an officer for life without any successor, simply because this gentleman has been a faithful and good servant to the people in methodizing the examination of the records." Such opposition as this did not prevent the bill's passage, but did influence President Harrison to veto it as unconstitutional, only a year after he had specifically commended Ainsworth in an annual message. The Record and Pension Office movement was temporarily checked; but next day Ainsworth was compensated by promotion to the grade of major.

A year later a new Record and Pension Office bill, without the objectionable promotion clause, became a law. It was a great Ainsworth triumph and was regarded as such; incidentally, it demonstrated how closely connected were administrative reform and political considerations. For the two decades ensuing Ainsworth was well-nigh invincible. The reason commonly given for his strength within the War Department and the national legislature was that his "carded records" had made him indispensable both to the pension-givers on Capitol Hill and the department officials on Pennsylvania Avenue. This theory was probably a generalization far removed from the truth. The chief of the Record and Pension Office was strong because he knew his records and organization to the last point, because he was sagacious in the ways of politics and human nature, and because he did not mind an occasional squabble when he felt something to be at stake.

All these qualities are revealed in the tales (then greatly relished) of how Ainsworth would with the utmost urbanity receive important visitors in his private office, listen carefully to whatever they had to say, and personally attend to their wants. People liked to relate how he kept a stack of such office publications as

were in demand (and elsewhere easily obtainable) in readiness for distribution, as a special sign of favor, to those who took the trouble to come and ask him for them. On the other hand, when he so wished he was capable of the most vitriolic denunciation; his eyes would become cold and hard as steel and his voice like a knife; but such displays were reserved for erring clerks, the impressionable, or foolhardy transgressors upon the proprieties of his position. Those who were not terrified by such a reception he respected.

"There is no concealing the fact that Ainsworth has more personal influence in Congress than any man in the government, including the President!" was the later verdict of Major Archie Butt. This reputation was beginning to form in the nineties when the Record and Pension Office was the largest bureau of the War Department and its head was influential in proportion.

Its most colorful test came when the front part of the old Ford Theatre building collapsed one June morning in 1893, carrying with it three floors of clerks busy carding muster rolls. A score of these unfortunates were killed and four times as many injured in the catastrophe, and Ainsworth became a public scapegoat overnight. A feeling against him which had been frequently observed among some of his employees broke into the headlines and was given a touch of morbid fascination by the charge that he was responsible for the overcrowded and unsafe condition of the structure. This was of course not the case (a contractor's carelessness was mostly to blame), but in the excitement there were outspoken suggestions that Ainsworth be strung up on the nearest lamp post as an object lesson to a grasping government. These steamy alarums and excursions evaporated after a few days. Although Ainsworth was reported to have carried a pistol against contingencies, there was no really serious threat against his life. He attended the coroner's hearings (until debarred) with a fine air of contemptuous hauteur which won him a good deal of respect and not a little admiration. It was a dramatic spectacle and the populace thoroughly enjoyed it.

The Ford Theatre episode soon became local legend. It made Ainsworth better known than before and showed what an influential personality he had become. Congress compensated the victims, often using his recommendations, the G. A. R. helped salvage muster rolls from the ruins, and carding went on as before in a new building on F Street.

By this time cards had been made out for most of the Civil War volunteers. The Indian and Mexican Wars were next carded, and, eventually, the War of 1812 and the Revolutionary War. The records of the latter two wars being in the possession of the Interior and Treasury Departments, Ainsworth enlisted the authority of a helpful Congress to have them transferred to his custody for the purpose of carding. The passing of the Pension Act of 1890 gave the Record and Pension Office another impetus by enlarging the roster of pensionables. After a

while the Spanish War added thousands of names; and by that time the other wars had practically all been carded.

Ainsworth's reports continued to point out, in his precise English, that he had saved the government a fortune. This and other references to the virtues of the Ainsworth system became wearisome to his detractors, who called attention to the fact that carding was expensive and that the whole pension industry was itself not altogether conducive to the national welfare. His strict methods of management were subjected to censure, also, and his brusqueness won him some ill-will inside and outside of the Army.

An important factor in this growing criticism of Ainsworth, in the light of later events, was the antagonism which members of the historical profession came to feel against him. At the turn of the century American historical scholarship was becoming well organized and was turning with zeal to the study of official documents having significant bearing on the nation's past. Connected with this tendency was a decided movement for a national archives building. The proposed "Hall of Records," as it was generally called, was conceived as a resting place for all federal archives no longer in active use, a kind of gigantic warehouse where documents thought to be important could be preserved against loss and where those interested could study them with the assistance of a trained personnel. The historians from this time on warmly urged the establishment of such a repository and enlisted the aid of publicists and friendly congressmen in this cause.

Against this movement Ainsworth set his face with the most steadfast determination. To his mind, the War Department archives were not public property in the democratic sense of the word; they were government property, and as such should be used only by high federal officials. He believed, furthermore, that the soldiers' histories were of a "confidential nature" which demanded that the government withhold them from the eyes of his generation "to prevent the improper use of the information afforded by them." This point of view was a logical one for him to have; it was a conservative reaction which typified the political-pension aspects of his position. His definition of archives, moreover, included such prized collections as the files of the Confederate government and certain personal papers of Jefferson Davis. These he refused to allow any parvenu student to see, and he added, categorically, that the "Hall of Records" was out of the question for years to come. As President of the Board of Publication of the official records of the Civil War, he supervised, in the later stages, the careful editing to which those documents were subjected.

Such conflicts did not perturb Ainsworth in the least. As has been said before, he enjoyed a good contest with no holds barred. By the turn of the century, however, such tempests became more frequent and more acrimonious as he advanced farther away from the pension and record stage of his course and entered the

arena of Army and departmental machinations. In 1899 he was appointed brigadier general; his influence was now greater than ever throughout Washington officialdom and he was rapidly becoming a suitable candidate for higher honors. In 1904, at the time of the Root reorganization plans, Ainsworth emerged from the agitated struggle for power which was then precipitated with the rank of major general and the position of Military Secretary. The anomalous character of this office (which was created much in the way the Record and Pension Office had been set up), the bitter enmities engendered by plots and counterplots, and the intermixture of political considerations all helped to make the Military Secretary an object of criticism in due proportion to his elevation. The assistant surgeon had come a long way, but there were signs of trouble ahead.

There yet remained before him, however, the ancient office of Adjutant General. Although the Military Secretary had control of the records and (to most practical purposes) the functions which had once belonged to the Adjutant General's Office, and although various General Staff agencies had taken over certain other functions, the position still seemed strong because of the strong army associations it retained; associations which were symbolized in the prestige of its title. Ainsworth's elevation to this high place in 1907 was the high point of his career. It was, moreover, consistent with his previous activities; for both in 1892 and in 1904 he had taken over vital parts of the AGO and ever since coming to Washington he had been concerned with the "staff" aspects of army government. As a matter of fact, his new title had been assured since the legislation of 1904; it occasioned little surprise and was, of course, regarded as a congressional tribute. By hard work and hard sagacity Ainsworth had made himself a power in the entire War Department. If this was bureaucracy, he might have reasoned, he had certainly made the most of it. In the following five years he consolidated his position and increased his reputation for conservatism in army affairs.

In 1912 the whole Ainsworth pattern was torn asunder in the struggle between him and Chief of Staff Leonard Wood for supremacy in the War Department. This contest, which had implications beyond its line and staff aspects, ended with unexpected suddenness when Secretary of War Henry Stimson requested Ainsworth's resignation on the basis of the immoderate language of a memorandum which the Adjutant General had written to Wood on the subject of changes in army paperwork. Whatever the more fundamental issues or developments might have been, it is interesting to note that this "battle of the doctors" embraced most of the complicated emotional and political elements which had become a part of the Ainsworth story. There was, for instance, some connection between the difficulties in the War Department and the pending legislation for army changes in Congress; the imminence of an election campaign gave the whole situation significance in the light of an impending split in the Republican party; and prominent

historical scholars used this opportunity to press their arguments for a different management of the Department's archives. At this critical juncture Senator Warren, then a firm ally of Ainsworth, encouraged him to request retirement rather than undergo a court-martial; and, "after twenty-five years of service," the former Adjutant General quietly wound up the business on his desk, gave necessary instructions, and walked calmly across the sun-lit portico of the State, War and Navy building to be driven off in his carriage for the last time.

His retirement did not prevent Ainsworth from exercising a certain sway over congressional councils, particularly with regard to later army legislation. He very probably had some influence in the formulation of the first National Defense Act and his position on such matters was for a number of years something to be taken into consideration. His work with the old Record and Pension Office has, indeed, never quite been entirely forgotten on Capitol Hill.

Until 1925 he took an active part in the National Rifle Association. He also contributed to, and encouraged the study of corrosion in small arms, and wrote a report which was a definite contribution to contemporary knowledge on the subject; in this he enlisted the aid of the Dupont chemical laboratories and the Bureau of Mines. In his last years he could frequently be seen striding up Rock Creek Park, seemingly as hale as ever.

Finally, in 1934, this remarkable history came to an end. Ainsworth was then eighty-two years of age. Behind him was a long and unique life full of the most stormy encounters and lasting affections, and a career which had always been dominated by his determined will and whose ambitions had been rewarded in unusual measure. And, since Ainsworth was such a paragon among the Washington bureaus, it is not inconsistent that his most striking memorial is the millions of carded records still testifying to the former army surgeon who made them such a success.

UNITED STATES MILITARY SHOULDER ARMS, 1795-1935

By James E. Hicks

3. The French Infantry Musket of the Models of 1763 and 1766

A BRIEF account of the development of the French military musket during the eighteenth century, of its superiority in range and general sturdiness over the arms of other countries, and of its adoption as the pattern for our first government-manufactured weapons has been given in the preceding number of this series. The greater part of these muskets which found their way to America during the Revolution were of the model of 1763, a few were of the model which followed, that of 1766. Throughout this war the "Charlevilles"—for so all had come to be called, regardless of their actual place of fabrication—gave splendid service and upon its close became the regulation weapon of our minute military establishment. So faithfully were they copied in 1795 by our own armorers, when at last we commenced to manufacture small arms in this country, that even their name was adopted, while they themselves gradually were relegated to the store houses under the title of "Common French Muskets."

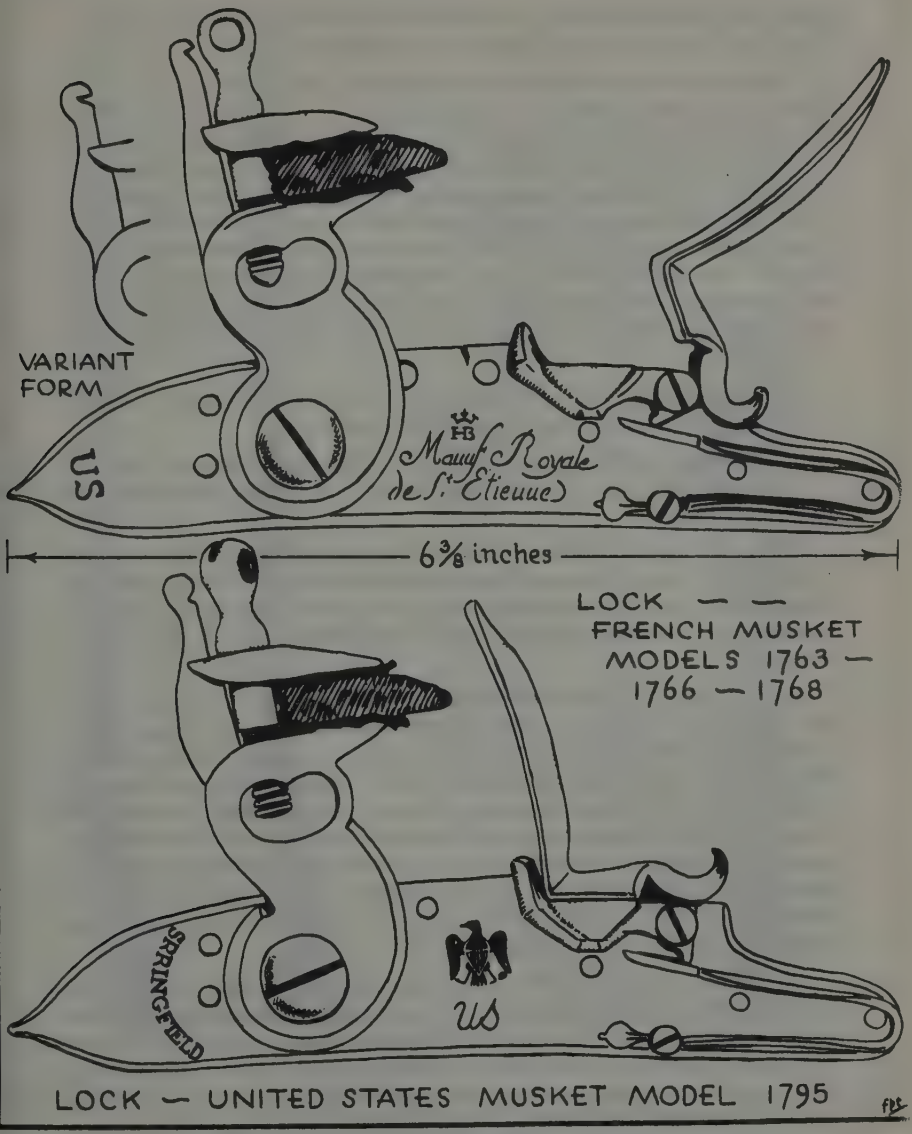
The model of 1763 had the following general characteristics:

Overall length	c.59¾ inches
Length of barrel	c.44¾ inches
Length of stock	c.57 inches
Total weight with bayonet	9¾ to 10¼ pounds

Smoothbore musket for infantry use.

The calibre was normally .69 inches, but this varied sometimes as high as .71 inches. The lock plate had a flat face with beveled edges and was 6⅜ inches in length having the rear end terminating in a decidedly sharp point. The pan was of iron construction, had a rather high fence and was removable, being fastened to the lock plate with two screws. The pan was of a somewhat peculiar design since it had three flat exterior faces tapering into one another. The frizzen had a pronounced curve at the bottom end which rested upon the frizzen spring. The face of the cock was flat with beveled edges and was of the double-neck type peculiar to the French muskets of that period.

Outstanding features of the furniture of this musket were the broad flat bands, used for retaining the barrel in the stock. These bands were held in place by springs inletted in the stock to the rear of each band which held them in place by a pointed projection engaging through a small hole drilled in the rear righthand



LOCKS OF THE FRENCH AND UNITED STATES MODELS

side of the bands. Also unique was the long (12½ inch), two-piece trigger guard. The trigger was independent, held by a pin through the stock.

These muskets were not equipped with rear sights, but on the rear half of the muzzle band (upper band) was brazed a long, narrow brass front sight. There was a bayonet stud on the barrel approximately one inch back from the muzzle. From an examination of different models from 1717 to 1763 it would appear that this bayonet stud was placed variously on the top or bottom of the barrel, although in the 1763 model the latter system usually applied. Bayonets thus might project from the right or left of a barrel. The ramrod was of iron construction with a large flat buttonhead. The sling swivels were eliptical in shape and the rear swivel was attached to a stud projecting through the trigger guard in front of the trigger bow. The upper swivel was attached to a stud on the bottom side of the middle band.

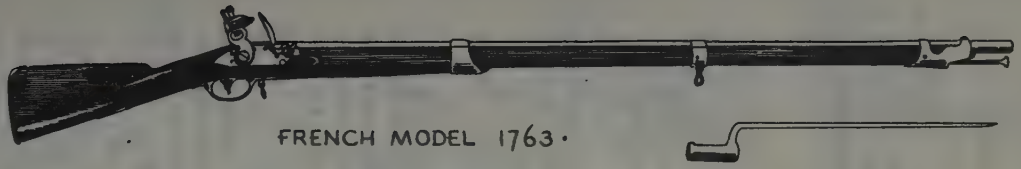
All the metal parts of this musket were of iron and were kept bright. With the exception of the front sight, no brass mountings appeared.

The stock was usually made of black walnut and the small of the stock extended well down into the body. The butt plate of iron was rounded, 4⅜ inches long and 2 inches wide.

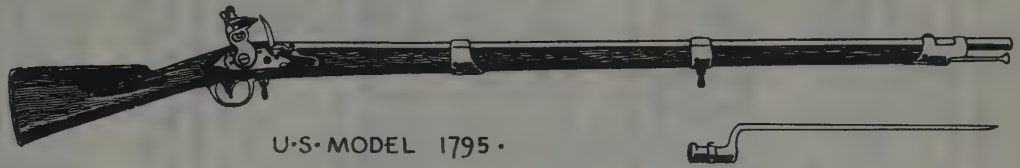
The bayonet usually attached to this model was of simple design with a 14 inch blade, one inch wide at the rear. The socket had no reinforcing ferrule at the base. The use of locking rings (to more firmly fasten the socket to the barrel) was commenced with this model, although many of the earlier bayonets were not so equipped.

The markings usually found on these imported muskets reflect both their origin and ultimate use. On the lock plate was the name of the French arsenal, either "Charleville" with a crowned "D," "Maubeuge" with a crowned "H," or "Manuf Royale de St. Etienne" with a crowned "HB." Many were stamped with the model number on the breech tang or on the rear of the barrel itself. The markings of our own service appear at a number of different places: a "US" was commonly stamped on the barrel, the breech tang, and the bayonet, and almost always on the lock plate. As if to take no chances of a mistake, the stocks were often branded with "U STATES" and the barrels and bayonets marked with a regimental designation such as "NH 1 B No 434" or "C.5."

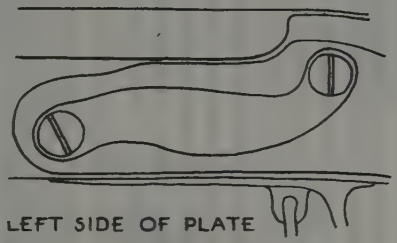
The model of 1766 was, with slight exception, similar to that of 1763. The barrel was made lighter and thinner and a spring was attached underneath the barrel to hold the ramrod in its channel. The bayonet was improved by the use of a flat spring around the socket instead of a locking ring. In 1768 the length of the barrel was reduced about one inch and slight changes were made in the sling swivels. Later models up to 1777, a few of which found their way to this country, bore small changes, chiefly in the lock plate.



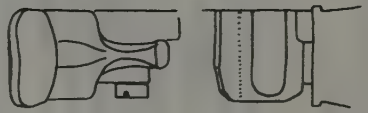
FRENCH MODEL 1763.



U.S. MODEL 1795.



LEFT SIDE OF PLATE

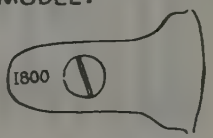


TOP VIEW OF FRIZZEN AND PAN

U.S. MODEL:



BOTTOM VIEW OF BOTH MODELS.



YEAR OF MANUFACTURE ON TANG OF BUTT PLATE.

fpt

4. The United States Musket Model of 1795

This musket, the first model manufactured by the government, was copied from the French musket model of 1763. Its general characteristics were:

Overall length	c.60 inches
Length of barrel	c.44¾ inches
Length of stock	c.57¼ inches
Total weight with bayonet	8⅞ to 9½ pounds

Calibre c. .69 (varied as high as .71 inches)
Smoothbore musket for infantry use.

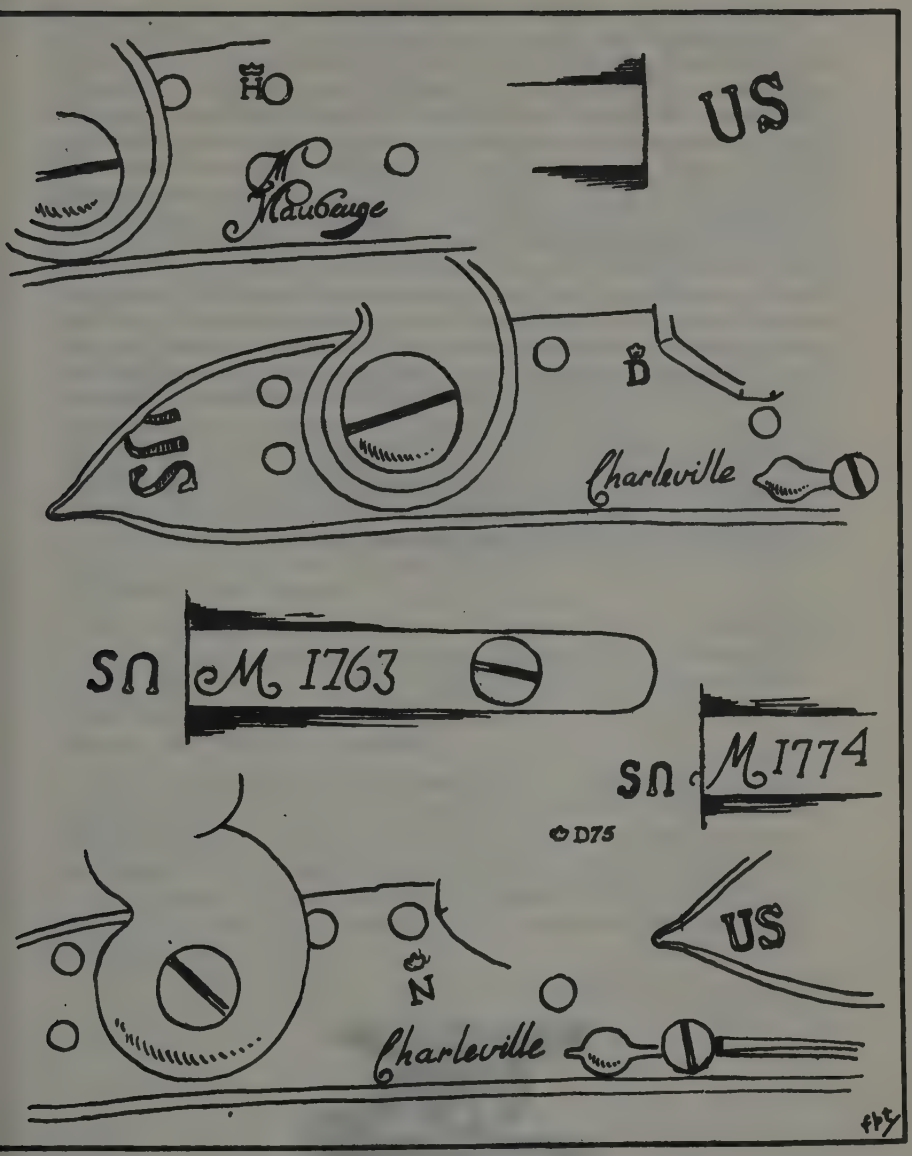
The barrel had a bayonet stud on the top placed approximately 1¼ inches from the muzzle. The breech screw was screwed into the rear end of the barrel and had a tang 2½ inches long. There was a hole through the tenon which allowed the rear lock plate screw to pass through. A lug on the bottom side of the barrel fitted into a recess placed in the stock underneath the front band to secure the barrel from turning.

The lock plate had a flat face with beveled edges, with the rear end terminating in a point. The plate itself was 6¼ inches long and 1 3/16 inches wide. The cock was flat-faced with beveled edges and reenforced under the jaw. The pan, of iron, had a fence to the rear and was not made to be detachable at first. Later, detachable pans were adopted.

The stock was of black walnut. The barrel was mounted on the stock by three bands having springs inletted in the stock to the rear of each band, these springs being approximately 2¾ inches long and quite narrow. The bands had small holes drilled on the rear righthand side through which the protruding end of the band springs projected, thus holding the bands in place. The front band was known as a double band, being 2¾ inches long with two rings ¾ inches wide, the rear one having the brass knife blade front sight welded to it. The middle band, 1 1/16 inches wide, had on its lower face the stud into which the upper eliptical sling swivel was attached. The lower eliptical sling swivel was attached to a stud projecting through the trigger guard in front of the bow. The ramrod was of iron and of the buttonhead type. The trigger guard, like its French pattern, was long (12¼ inches) and terminated in a point.

The exact type of bayonet used with this model is uncertain, but in the later issues, at least, it was of the spade type, 15 inches long with a light shank of about two inches. The width of the blade was at the rear about 1⅛ inches; while some sockets may have been equipped with eliptical springs it is doubtful if any bore locking bands.

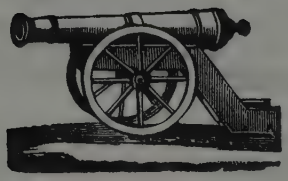
The markings of this model consist of a "U S" in script beneath a spread eagle, head facing to right (rear), on the center of the lock plate and "SPRINGFIELD"



MARKINGS FOUND ON FRENCH MUSKETS, MODELS OF 1763 TO 1777

in a curve from top to bottom on the rear of the plate. The barrel was usually marked with a "US" and a "VP" (viewed and proved), together with another proof mark in the form of a small eagle head. The date appears on the butt plate tang, a marking peculiar to this model. In some muskets of this type, which Mr. Claude E. Fuller suggests were made up as patterns for suggested changes, the eagle on the lock plate looks to his left and the "SPRINGFIELD" is curved lengthwise.

Very little is known about the firing qualities of this model. Since it was copied from the French musket, we may assume that it had a point blank range of at least 100 yards; that its recoil was less and its accuracy greater than the average musket of the period. As was usual with muskets of this type, the bullet was cast with a diameter nine-tenths that of the barrel. This was due to the fact that such a large percentage of carbon residue was left in the barrel after each shot that, after a few rounds, loading would have virtually been impossible had not this play been allowed for the bullet. This excessive play, or windage, however, permitted the ball to rebound from side to side down the bore, causing an erratic flight after it left the muzzle. To this is due the inaccurate fire so common at this time. The muzzle velocity of the early eighteenth century musket ball, as tested recently with the aid of spark gap photography, was about 825 feet per second.



PROFESSIONAL NEWS

A LETTER FROM THE PRESIDENT OF THE FOUNDATION

The Trustees of the Foundation are pleased to announce the appointment of Brigadier General John McArthur Palmer, U.S.A., Retired, to membership on the Board of Trustees. They wish also to take this opportunity to express their appreciation of the confidence in the society indicated by Mr. Wickliffe Draper, Mr. Hoffman Nickerson, and Dr. James Brown Scott, who have during the past year become Founder Members.

The Trustees further desire to thank the temporary board of editors who saw the JOURNAL through its first year of publication. Our acknowledgements go with this letter to Messrs. Codd, Spalding, Scofield, Gray, Weaver, Irvine, Russell, and Todd. Their achievement is best appreciated by those who know the difficulties met with and surmounted.

With this issue the editorship is assumed by Dr. H. A. De Weerd of Denison University. The new editorial board consists of Mr. Frederick P. Todd, the present Secretary, Mr. Joseph Mills Hanson of the National Park Service, Mr. Don Russell of the *Chicago Daily News,* and Mr. Siert F. Riepma of The National Archives. The best wishes of the Trustees and Officers of the Foundation are extended to the new board of editors at the beginning of the second year of publication for the JOURNAL.

William L. Rodgers, Vice Admiral, U. S. N. Retired,
President.

THE MILITARY LIBRARY

The Second Admiral: A Life of David Dixon Porter, by Richard S. West, Jr. (New York: Coward McCann: Pp. 376. 1937. $5.00.)

This is an excellent biography of one of the most colorful officers of the old Navy whose highly distinguished services in the Civil War mark him as one of the greatest admirals. His support of Grant's Army in the capture of Vicksburg is a classic in military-naval cooperation, and seems to have been duly appreciated only by General Grant who is most generous in acknowledging in his memoirs the primary importance of the naval contribution to the victory.

Mr. West's book is the kind of naval history that needs writing. It is a well expressed and most interesting study based on a thorough study of original source material. It is full of "color" and human interest as well as being scholarly and exhaustive.

The only adverse criticism that could be made is that occasionally the professional reader detects too much of the layman's viewpoint in minor technology and too little understanding of and emphasis upon Porter's greater achievements. However, the facts are well assembled for due interpretation by both professional and lay readers.

It is an exceedingly entertaining narrative as well as a work of great value for reference.

DUDLEY W. KNOX

Lafayette Joins the American Army, by Louis Gottschalk. (Chicago: University of Chicago Press. 1937. Pp. 364. $3.00.)

If arithmetic permitted, this work might have as a sub-title "Twenty Months in the Life of a Twenty-Year-Old." Lafayete, despite the official displeasure of the King and the angry remonstrance of his influential father-in-law, sailed from Bordeaux and arrived in America June 13, 1777. He came with little to recommend him save his wealth (and willingness to spend it), his rank, and an insatiable thirst for military glory. Of English he had little knowledge, of military tactics possibly less, and he faced an America grown weary if not actually contemptuous of French soldiers of fortune. Yet when he sailed for France in

January 1779, he had securely laid the basis of the Lafayette legend. The achievements of those twenty months are glorious by whatever standard of measurement.

If Lafayette attains heroic stature in the mind of the reader, it is his own judgement, for Doctor Gottschalk simply lays the facts before him in interesting but dispassionate prose. Here for the first time one may read a well-documented account of the relationship of Lafayette and Washington, of Lafayette and the Continental Congress, and the facts of his first military achievements.

There is something fascinating in the friendship between the exuberant young Lafayette and the austere commander-in-chief. With Lafayette it amounted to a veneration bordering on idolatry and in Washington there developed gradually a sincere attachment. Doctor Gottschalk, as an authority in the history of the French Revolution, is keenly interested in the growth of Lafayette's philosophy of political liberalism. This liberalism was not, as is commonly supposed, the product of his first sojourn in America. He was neither a liberal nor a republican when he came to America, and he returned unchanged save possibly for some germ which his admiration for Washington may have implanted.

Lafayette must have been considered a great nuisance by the sorely vexed members of the Continental Congress. He was the self-appointed spokesman for the numerous Frenchmen who were eagerly seeking commissions in the American army. In the intricacies of the Gates-Conway cabal against Washington, Lafayette almost instinctively followed the right course, displaying a skill in counter-intrigue which was nothing short of precocious. Here is a most interesting study in the conflict, perennial in American history, between the general in the field and the civil government. Washington had Lafayette's unbounded sympathy. Congress, he felt, placed far too many restraints on the General. "Resolveds of Congress (and which resolveds good God!) are sent every day to stop his operations and push him in very bad ones," he wrote to his friend Laurens.

The military exploits of the Marquis receive adequate treatment, though in less detail than in Charlemagne Tower's *The Marquis de La Fayette in the American Revolution* (2 vols.; Philadelphia, 1901). One follows easily the distinguished conduct of the hero at Brandywine, Gloucester, Barren Hill, and Newport. Nor is there any attempt to gloss over the less satisfactory performance of Lafayette at Monmouth. The contemporary maps, here reproduced, are a valuable aid although details are deciphered with difficulty. With the entrance of France into the war Lafayette found himself repeatedly torn between loyalty to his own country and the danger of offending his comrades-in-arms, particularly in the abortive operations in Rhode Island. For the account of Lafayette's contributions to the concluding campaigns of the war which followed his return in the Spring of 1780, one must await the appearance of the third volume in this excellent series. The

sound scholarship of the first two volumes leads one to prophecy that of all the biographies of the great Marquis, this is the least likely to be superceded.

WILLIAM T. UTTER

Pen and Sword in Greece and Rome, by Oliver Lyman Spaulding. (Princeton: Princeton University Press. 1937. Pp. 151. $2.00.)

All military antiquarians in good standing, classicists, historians, and soldiers are cordially invited to this literary feast prepared by Colonel Spaulding. For the first time there is readily available in the English language a summary of Greek and Roman military thought.

The texts of Homer, Herodotus, Thucydides, Xenophon, Aeneas Tacticus, Asclepiodotus, Onasander, Polybius, Arrian, Caesar, and Procopius are printed in English. Vegetius will not become readily available until the translation of Lester K. Born or some other scholar has been published; and the *Strategikon* will not yield its treasures even to the average reader of Greek until Colonel Spaulding's translation is in print. And even if all these our principal sources for a knowledge of how wars were fought in antiquity were accessible in English, how many of us would wade through them or even dip into them? How many of us would consult Jähns' *Geschichte der Kriegswissenschaften* or Ludovic Jablonski's *Histoire de l'art militaire* which contains brief extracts from ancient military writers including Vegetius and Leo?

Entertainingly written, as in a series of book reviews, the character of the principal ancient military texts is revealed, often with illuminating comparisons with modern manuals; for as the author points out, "their modernity is surprising . . . when we first dip into them; one realizes almost with a shock, that the ancient warrior did not know that he was an ancient warrior . . . and, after reading more we are forced to admit that . . . we have not improved much upon him." Xenophon reads like any modern manual, on marches and the services of security and information. He and Vegetius stress the need for constant reconnaissance; and the latter prescribes that reports be accompanied by sketches. In Vegetius and a manual by an anonymous Byzantine we have a form for "estimating the situation." Many of the ideas of soldiers today may be traced directly or indirectly back to Xenophon, who in turn derived them from Private First Class Socrates of the Athenian Army.

Those who may have occasion to return to this book for reference purposes will regret the lack of an index.

J. M. SCAMMELL

Military History of the World War, by Girard Lindsley McEntee. (New York: Charles Scribner's Sons. 1937. Pp. 582. $7.50.)

Colonel McEntee has made a brave attempt at the almost impossible task of compressing "a description of the military tactics employed in the campaigns on

all fronts" during the World War into a single volume. Despite the too-ardent claims of the publishers his apparent purpose was to present a bird's-eye view of Armageddon to the lay reader. In this he has succeeded so well that there would seem to be little need for another book of this type.

The outstanding feature of the volume is the wealth of maps and diagrams which make the necessarily brief text clear to the average reader. In the opinion of the reviewer Colonel McEntee's maps are better than his text. Casual students of military history will find this book a handy volume for reference with graphic maps to illustrate all major campaigns. The serious student will be annoyed by the conventional nature of the text, the completely uncritical biographical sketches of leading commanders, and the careless proof reading. Proper names differ in spelling on maps of the same area and also with that of the text. Freytag-Loringhoven comes through Colonel McEntee's mill as Freytag-Lounghoven (p. 570). Karl Tschuppik appears (p. 575) as Tschuppils. In his vast and uncritical bibliography titles such as: Purington, *Pétain, the Prepared* (1917) and works by Richard Harding Davis are cited but not the French and German official histories. One distinguished soldier with a flare for the ironic observed that the proper place for this volume in the world of military history "is best evidenced by the fact that it has been adopted as a text book at the United States Military Academy."

H. A. De Weerd

Carbine and Lance: The Story of Old Fort Sill, by Captain W. S. Nye. (Norman, Oklahoma: University of Oklahoma Press. 1937. Pp. 441. $3.00.)

Adventure on Red River: A Report on the Exploration of the Red River by Captain Randolph B. Marcy and Captain G. B. McClellan, edited and annotated by Grant Foreman. (Norman, Oklahoma: University of Oklahoma Press. 1937. Pp. 199. $2.50.)

Two interesting and valuable books relating to the army and the West have recently appeared from the University of Oklahoma Press. *Carbine and Lance* tells the story of old Fort Sill and the Indian warfare in which it was involved. The author has given his subject a well-rounded treatment by reviewing the Indian troubles which preceded the founding of Fort Sill in 1869 and ending with an account of its modern sphere of usefulness. Considerable space is devoted to incidents in the harsh guerilla warfare against the Kiowas, Commaches, Cheyennes, Arapahoes, and Kiowa-Apaches. Captain Nye attempts to avoid a biased view in the long-standing controversy between the Army, the Indian, and the Department of the Interior. His story is enlivened by many interesting anecdotes (some doubtless apochryphal) and illustrated with many maps and portraits. He has provided the reader with an index and, what is even more useful, a glossary of terms and phrases.

Captain R. B. Marcy's report on the expedition of 1852 which explored the headwaters of the Red River has long been out of print. In *Adventure on Red River,* Dr. Grant Foreman has prepared a new edition of Captain Marcy's report with notes, biographical introductions and bibliographical aides. Captain Marcy's engineering officer on the expedition of 1852 (Marcy took part on five expeditions) was Captain George B. McClellan, future commander of the Army of Potomac. This expedition revealed that the Red River had two main branches, a fact which later caused a boundry dispute between Texas and Oklahoma. Captain Marcy's day-by-day journal contains descriptions of the Indian tribes, their habits of living and methods of warfare. Although in general the editing is excellent, the reviewer would have welcomed the citation of sources for the illustrations and for the useful folding map.

DON RUSSELL

A History of Militarism: Romance and Realities of a Profession, by Alfred Vagts. (New York: W. W. Norton & Co. 1937. Pp. 510. Illustrated. $4.75.)

Dr. Vagts, a German (now living in America) who served as private and officer in one of the German combat branches during the World War, is already represented in his own language by various volumes in the fields of world politics and international affairs. This is his first work in English. Nothing of the scope of the present volume has previously appeared in this language, and for that reason, if no other, the book should be immensely attractive to the student of army history and of the army's relationships with society.

In attempting to show what factors have shaped armies and military attitudes since the rise of the standing army, Vagts has been content to restrict himself largely to somewhat obvious influences. For the most part he deals with the officer class and what it has presumed to be its "interests", setting this class mainly against a background of military action and military philosophy. But there is a greater background, that of society itself, which must come into the picture if militarism is the subject. The reader cannot be wholly informed as to how "armies affect society" unless he is also informed rather plainly how society affects armies. Unfortunately, Dr. Vagts has failed to make this well-rounded picture appear.

To indict Vagts thus is to deny some part of depth and clarity to what he attempts to do, but by his own definition he has limited the effectiveness of his work as a sociological study and certainly as a definitive work on the history of militarism. Perhaps a synthesis is so limited by nature that it necessarily runs thin when covering such a vast subject, but the deeper limitation is of Vagts' own making. An analysis of the distinction he makes between a "military way" and a "militaristic way" may help to illustrate this weakness. Vagts writes:

> The military way is marked by a primary concentration of men and materiels on winning specific objectives of power with the utmost efficiency, that is, with the least expenditure of blood and treasure. It is limited in scope, confined to one function, and scientific in its essential qualities. Militarism, on the other hand, presents a vast array of customs, interests, prestige, actions and thought association with armies and wars and yet transcending true military purposes. Indeed, militarism is so constituted that it may hamper and defeat the purposes of the military way. . . . It may permeate all society and become dominant over all industry and arts. . . .

Now this is a perfectly rational and laudable distinction between what is morally good in a profession and what is bad—but it goes no farther than the profession itself, despite the allusion to "all society". The test word of the "military way" is "efficiency", defined as "the least expenditure of blood and treasure." But a militaristic society may conceivably give birth to an army which is wholly efficient in this sense. Militarism involves a much larger concept of society than is defined by the opposite of the "military way".

Hans Speier, another German expatriate, has defined the militaristic social structure in its broadest sense as that in which ". . . political power and social esteem are distributed in favor of the military class. . . ." In its extreme form militarism exists ". . . when the distribution of power and esteem assumes the form of centralization of control, an attendant state monopoly of raising, controlling and equipping armies, and a universality of military mores." [1] Accepting this as a broader foundation, one may see that there are various orders and degrees of militarism, to be studied much as one might study industrialism. Dr. Vagts skirmishes around the edges of these ideas, he touches them and even handles them when he is finally confronted with the Society-in-Arms, but does not make them clear to the reader.

Had he grasped these broader elements clearly, even though restricting his own study to the developing class interests of armies and army officers, there would be no reason to criticise his own working arrangement as to the distinction between militarism and the military way. Not grasping them, he has left the reader to wonder for instance why the book is so overcast by the Prussian influence, even rather paradoxically in those pages dealing with the armies of other countries. Militaristic influences are not properly weighted. One leaves the book with the feeling that the Prussian elements have been allowed to get out of hand.

This rather severe reaction, like all reactions expressed in book reviews, is in no way fair to Dr. Vagts. He has assembled a tremendous amount of material on armies, showing the internal interests and political pressures which have helped to make and unmake them through the years: the standing armies which replaced the "individualistic warriors" of the feudal period; the mass armies of the Napoleonic period, fervently nationalistic; and down through the World War,

[1] "Militarism in the Eighteenth Century", *Social Research*, III, p. 304.

out of which emerges the Society-in-Arms, fused by such extraordinary heat that the blow-up must take armies and civilians alike into new phases of frenzy. Democracies may only hope that Dr. Vagts is right, that it is reasonable to suppose a ". . . democracy is preferrable from the sheer technical point of view" to the super-militaristic state.

Vagts writes well and certainly with no trace of dullness. His approach to the subject is intelligent and realistic. One would hope above all that those unreasonable citizens who go completely blind when the word "military" is used, might read this book. Nowhere more than in a democracy are the teachings of this book needed.

WAYNE C. GROVER

The Western Military Frontier, by Henry Putney Beers. (Philadelphia: 1935. A Doctoral Dissertation at the University of Pennsylvania.)

Others writers have hinted that the principal occupation of armies in time of peace is self-aggrandizement; Dr. Beer's dissertation shows that although the country may have been at peace, the American army has generally been at war with someone or something, and demands upon it for protection and relief have been continuous. Advocates of the "self-aggrandizement school" of thought will find little comfort in these pages. In 1784 the regular army had a strength of eighty men!

The army was called upon in the 1790's to prevent raids upon the settlers by the Indians and *vice versa* during the settlement of Tennessee country. When this was being accomplished Dr. Beers shows that there were only 79 Federal troops in the territory. The occupation of the Louisiana territory was largely the work of the army. Early in 1804, when the Americans penetrated up the Arkansas River as far as Arkansas Post, an army lieutenant represented the might of the United States. An army of sixty men turned back the belligerent Spaniards from the Sabine River in 1805.

Dr. Beers has not sought to write a military history, but wherever he turns in describing the advance of the frontier, there he finds the army, forming a cordon just beyond the boundaries of civilization. He has covered the period up to the Mexican War. In 1846 the frontier ran from Corpus Christi to Minneapolis. The author has condensed a vast amount of fragmentary information into a reasonable narrative, and, best of all, he has given us a remarkable bibliography. We can only hope that Dr. Beers and other scholars will continue in this work and let us taste the flavor of the constantly moving frontier.

OLIVER LYMAN SPAULDING

OTHER RECENT BOOKS

Tales of a Field Ambulance 1914-1918, told by the personnel. (London: Southend Borough Printing & Publishing Co. 1937.)

War on Great Cities, by Frank Morrison. (London: Faber and Faber. 1937.) An account of the air raids on London from 1914 to 1918.

The War Office at War, by Sir Sam Fay. (London: Hutchison. 1937.) The author was the civilian director of movements at the War Office from 1916 to 1918 and tells of the movement of troops, war supplies, hospital ships and ambulance trains during hostilities.

Military Operations, France and Belgium 1918, An Official History, Vol. II, by Brigadier General Sir J. E. Edmonds, with maps and sketches by Major A. F. Becke. (London: Macmillan. 1937.) Takes the story of the German offensives from March 26, 1918 through April.

America and the World War, by Samuel Taylor Moore. (New York: Greenberg. 1937.)

Contact, by Charles Codman. (Boston: Little, Brown & Co. 1937.) An account of an American aviator's experiences in the World War.

Lawrence, The Last Crusade, by Selden Rodman. (New York: Viking Press. 1937.)

Remembering Kut, "Lest We Forget", by Derna Neave. (London: Barker. 1937.) An account of the experiences and fate of the garrison of Kut after the surrender.

Mesopotamia, the Last Phase, by A. H. Burne. (London: Gale & Polden. 1937.)

Taking Tanganyika, The Experiences of an Intelligence Officer, 1914-1918, by Christopher Thornhill. (London: Stanley Hill. 1937.)

Steel Chariots in the Desert, by S. C. Rolls. (London: Cape. 1937.) The adventures of an armoured car driver in Libya with the Duke of Westminister and in Arabia with T. E. Lawrence.

Frontline and Deadline, by Granville Fortescue. (New York: Putnam. 1937.) A war correspondent in action.

Schlieffen, Mann und Idee, by Oberstdivisionar Eugen Bircher und Walter Bode. (Zurich: Albert Nauck. 1937.)

The War in Abyssinia, by Pietro Badoglio. (New York: Putnam. 1937.)

NOTES AND ANTIQUITIES

A PROPOSED GAS SHELL, 1862

The American Civil War witnessed the introduction of several weapons and tactical branches admittedly new to our military establishment of that period, and, in some instances, new to the world at large. But for the indifference of the War Department, a chemical warfare agent remarkably similar in principle to those used today might have played an important part in this sectional struggle of three-quarters of a century ago.

On April 5, 1862, the same day that Fitz John Porter's division of McClellan's army arrived before Yorktown, a certain John W. Doughty, of New York City, addressed a letter to the Secretary of War, enclosing a plan for a chlorine gas shell which in principle and general action differed little from similar projectiles now in use. The letter, preserved in the Old Records Division of the Adjutant General's Office, is an item of some interest as illustrating the "modern" aspects of the Civil War.

Hon. Edwin M. Stanton Sec. of War
Sir

The above is a representation of a projectile which I have devised to be used as a means for routing an *entrenched* enemy. Believing it to be new and valuable, I send the War Department a brief description: Chlorine is a gas so irritating in its effects upon the respiratory organs, that a small quantity diffused in the atmosphere, produces incessant & uncontrollably violent coughing.—It is 2½ times heavier than the atmosphere, and when subjected to a pressure of 60 pounds to the inch, it is condensed into a liquid, its volume being reduced many hundred times. A shell holding two or three quarts, would therefore contain many cubic feet of the gas.

If the shell should explode over the heads of the enemy, the gas would, by its great specific gravity, rapidly fall to the ground: the men could not dodge it, and their first intimation of its presence would be by its inhalation, which would most effectually disqualify every man for service that was within the circle of its influence; rendering the disarming and capturing of them as certain as though both their legs were broken.

To silence an enemy's guns or drive him from his entrenchments, it would be only necessary to explode the shells over his head or on his windward side. If exploded in rapid succession over, or within a fort, evacuation or surrender could not be delayed beyond fifteen minutes. Casemates & bomb-proofs would not protect the men.

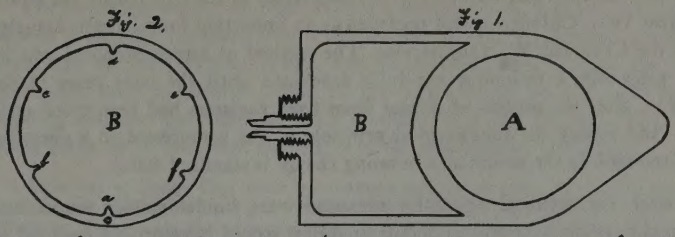


Fig. 1. Longitudinal section. Fig. 2. Transverse section of Chlorine chamber. The flanges a. b. c. d. e. f. are to strengthen the chamber, without much diminishing its capacity. A. Chamber of a Common shell. B. Chlorine Chamber. There is no communication between the two chambers; they are both in the same casting.

This kind of shell would, I think, in the present advanced state of military engineering, be a very efficient means for warding off the attacks of iron-clad vessels and *steam rams;* for, as to the steam ram, a ten inch gun that would carry a shell containing a gallon or two of the liquid, would with ordinary accuracy, be able at the distance of ¾ of a mile, to envelop him in an atmosphere that would cause his inmates to be more anxious about their own safety than about the destruction of their enemy.

It may be asked if the gas which drove the enemy from his guns, would not prevent the attacking party who used the gas, from taking possession of the abandoned position. I answer it would not: for, this shell does not like the Chinese stink-pots, deposite a material emitting a deleterious gas *lighter* than the atmosphere, but suddenly projects into the air, a *free* gas much *heavier* than the atmosphere, which does its work as it descends to the earth, where it is soon absorbed.

Experiment alone can determine whether this shell has any practical merit. Possibly, I overrate its value; but it must not be forggotten [*sic*], that while it does the work of an ordinary shell, it also carries with it a force against whose effect the most skillful military engineering can not possibly make any adequate provision.

As to the moral question involved in its introduction, I have, after watching the progress of events during the last eight months with reference to it, arrived at the somewhat paradoxical conclusion, that its introduction would very much lessen the sanguinary character of the battlefield, and at the same time render conflicts more decisive in their results.

If I have erred, I have, *at least* meant well.

Yours,
Respectfully,
John W. Doughty
April 5th/62 419 Eighth Avenue,
New York

Hon. Edwin M. Stanton

The manuscript is interesting in several respects. The toxic agent suggested was chlorine, the same gas used by the German Army in the first major gas attack in the Great War. Chlorine is still regarded as an important lung-irritant casualty agent by the Chemical Warfare Service. The method of attack proposed was by artillery projectile, a technique not fully developed until the later years of the Great War, after the process of release from fixed canisters had been tried early in 1915. And finally the fundamental principle of gas compressed in a chemical chamber released by the action of a bursting charge is standard today.

In general, the chemical principles advanced were fundamentally sound, and though modifications in technical details doubtless would have proved essential to success, the effective use of the projectile designed was far from a vague possibility. The inventor considered whether or not the use of such a weapon would be humane and met the issue as a realist with arguments that have been subsequently advanced in defense of chemical warfare. He did not claim the invention to be certain of immediate success, but plainly stated that "experiment alone" would demonstrate its value. And, singularly enough, there was no request for money, government position, or contract as a reward for the idea.

Later in the Civil War the idea of using chemical projectiles was again brought forward when Brigadier General Pendleton, Chief of Artillery of Lee's army, in 1864 advocated the preparation of "stink-shells." His suggestion was forwarded to the Confederate Ordnance Department, and returned with the following indorsement: "Stink-balls, none on hand; will make if ordered." Apparently they were never ordered.

Despite the practical possibilities of Doughty's plan, there is no evidence that the letter was ever answered, or that any consideration was given it. In the light of modern progress in weapons it would seem that the War Department ignored a suggestion that might have been made an important factor in the prosecution of the war. But if one considers the volume of curious suggestions and inventions that flooded the War and Navy offices, it is a wonder that Ericsson's ironclad, or Lowe's balloons ever received a hearing. What officials had to contend with is well illustrated by the letter of Joseph Lott, of Hartford, Connecticut, wherein he seriously advocated that fire-engines be run up to the Confederate works at Yorktown and Corinth to compel evacuation by spraying large quantities of chloroform on the defenders. With the Confederate garrisons thus anaesthetized, the capture of these besieged towns, wrote the well-meaning correspondent, would be a simple matter.

F. Stansbury Haydon

MULE EAR CURRENCY

The following story, like most Western reminiscences, probably has some truth as well as fiction. It is taken from a manuscript journal of anecdotes narrated some years ago by John Willis. Willis, who at one time was a guide for Theodore Roosevelt, spent a versatile youth. In the mid-seventies he had given up buffalo hunting and cow punching for mule skinning. The journal, based on shorthand notes taken by an interested listener, is in the possession of the society.

I hired out at Dodge City under government contract to drive six mules from the fort, loaded with baking powder, green coffee in sacks, bacon, cartridges and other stuff for Wichita, There were five six-mule teams in the outfit and twenty soldiers as an escort. Before we got there the wagon boss sold the stuff and pocketed the profits, which rather upset calculations. Some teams met us before we reached Wichita and got the cargo and took it into Colorado. So there was nothing to haul to Wichita. We all decided to take out teams to Wichita and sell them to a saloon keeper we knew. We sold the thirty mules for $3,000 and divided the money among us teamsters. The wagon boss couldn't do anything about it as we had him foul.

Selling other people's mules in those days was common practice, I guess half of old Major's mules were stolen, but I don't believe he stole them. I guess he paid good money for them. Why, mule stealing was so common that they used to hitch mules to a wagon wheel with thick steel bands.

When we left the fort the quartermaster told us something unusual; he said if a mule died to bring back his ears. He said this would prove that we had not sold the mule. So, when we went to driving teams for the government, if we found a dead mule we cut off his ears and sold one of the government mules we were driving for $100 or more in U. S. coin.

These ears would keep almost any length of time as they were salted. A man who ran across a pair of mule's ears would as soon think of passing 'em as he would of lighting his cigar with a hundred dollar bill. We put the ears in the cantina or saddle pockets as you couldn't pack 'em like money in a wallet or purse.

The price of a pair of mule ears was fixed all over the Southwest at $100 per. The mule was worth nearer $200, it's true, but it was considerable trouble cashing in the ears for the full value of a dead mule. Anywhere in the saloons the man who ran the game would give $100 in checks for the ears.

QUERIES

21. GOLD AND SILVER INSIGNA. Why is gold ranked inferior to silver in the insignia of colonel and lieutenant colonel and of first and second lieutenant?

H. K. B.

22. READ'S CAVALRY RIFLES. What were the "Read's cavalry rifles" which are mentioned in Confederate ordnance reports? The Virginia Armory issued 596 "Read's cavalry rifles" in 1862 and 220 again in 1863. The Armory reported 400 of these guns on hand in October, 1863.

RICHARD D. STEUART

23. LOYALIST MUSTER ROLLS. I should like to obtain information regarding the present location of any muster rolls (original or copies thereof) of those Loyalist organizations of the British Army who were active in northeastern New York and Vermont in 1777 and 1778. I am particularly anxious to know if any rolls exist for the Queen's Loyal Rangers, a corps commanded first by Colonel John Peters and later by a Colonel Jessup.

J. S.

24. PRACTICE BULLETS. In searching through old fort sites in Nebraska I frequently have unearthed balls made apparently of clay which closely resemble marbles. Many of these are about .69 inch in diameter which suggests their possible use as practice ammunition. They could have been dropped into the muzzle of a musket and later crushed to powder by the ramrod, thereby obviating the use of a screw. Have you ever heard of the employment of such practice rounds?

V. N.

REPLIES

17. CONNECTICUT, GOVERNOR'S HORSE GUARDS. There are three helmets in the collection of the Fort Ticonderoga Museum which have been reliably attributed to the Governor's Horse Guards of Connecticut and all relate to the period around 1800. I do not believe that photographs of these helmets ever have been published.

HARRISON K. BIRD, JR.

There is another helmet, together with other parts of the uniform, in the New Haven County Historical Society, New Haven, Connecticut, which belonged to a member of the New Haven troop, Governor's Horse Guards. Judging from other descriptions, this uniform would appear to be quite similar to that worn by the Hartford unit.

M. T.

19. BOOKS ON ARMY CUSTOMS. In General August V. Kautz's *Customs of Service for Non-Commissioned Officers* (1864) and his *Customs of Service for Officers of the Army* (1866) there is a good deal to be found on Army customs, although most of his material consists of extracts from various manuals. Probably the best on this subject are the manuals for officers issued between 1909 and 1929 by Colonel James Alfred Moss as well as his *Origin and Significance of Military Custom* (1917).

DON RUSSELL